Displacing Coal

An Analysis of Natural Gas Potential in the 2012 Electric System Dispatch

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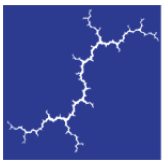

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1. INTRODUCTION

One of the challenges associated with the retirement of even the least efficient, least economic, and most polluting coal-fired power plants is the need to meet electricity resource requirements without these historically important facilities. However, in much of the United States, there is ample existing, unused potential that would require no additional plant construction costs to displace the generation from existing coal capacity. Although natural gas is currently a more expensive fuel per MMBtu, in some cases this replacement strategy would eliminate the need for expensive environmental upgrades, offsetting the additional cost. At the burner tip, natural gas plants emit less CO_2 than coal power plants per megawatt hour (MWh), with natural gas plants emitting 0.4-1.0 tCO_2/MWh versus 0.9 to 1.4 tCO_2/MWh for coal.[I] These numbers do not include upstream emissions that occur during the lifecycle of a fuel source, such as fugitive methane emissions from natural gas.[2] When the costs of carbon emissions are taken into account, a strategy of using gas-fired generation to displace coal-fired generation could produce significant economic savings, in addition to potential reductions in greenhouse gas emissions. In addition to air emissions concerns, both coal and natural gas have a litany of environmental concerns associated with the impact from producing these fuels. Examples include mountain top removal for coal and the impact of hydraulic fracturing for natural gas.

While the economic and environmental considerations regarding coal and natural gas continue to be investigated, Synapse has evaluated the available, unused natural gas generation that could feasibly be used to displace coal generation on a region-by-region basis. This analysis was conducted on a unit-by-unit basis; however, results are compiled at the scale of eGRID subregions and ISOs/RTOs, which approximate regional power markets. Synapse primarily analyzed combined cycle (CC) gas units, as these plants are relatively clean and efficient, and are able to operate as baseload and intermediate units at a wide range of capacity factors.[3] In our analysis, we assumed that existing CC units should be able to ramp up to a capacity factor of at least 80 percent, a level of output representing baseload operation, with allowance for planned and forced outages.

We recognize that there may be obstacles to increasing the output of individual gas-fired generators, including access to gas supply and pipeline capacity; environmental constraints; warranty conditions on the turbines; or other political, economic, or regulatory restrictions. Nonetheless, we believe that in many cases gas units could feasibly be (and were originally intended to) run at a much higher capacity factor than they are now experiencing, and that in many cases this may be a viable strategy for addressing the carbon emissions and other environmental and public health costs associated with coal-fired generation.

[I] EPA Air Markets dataset, 2008-2012.

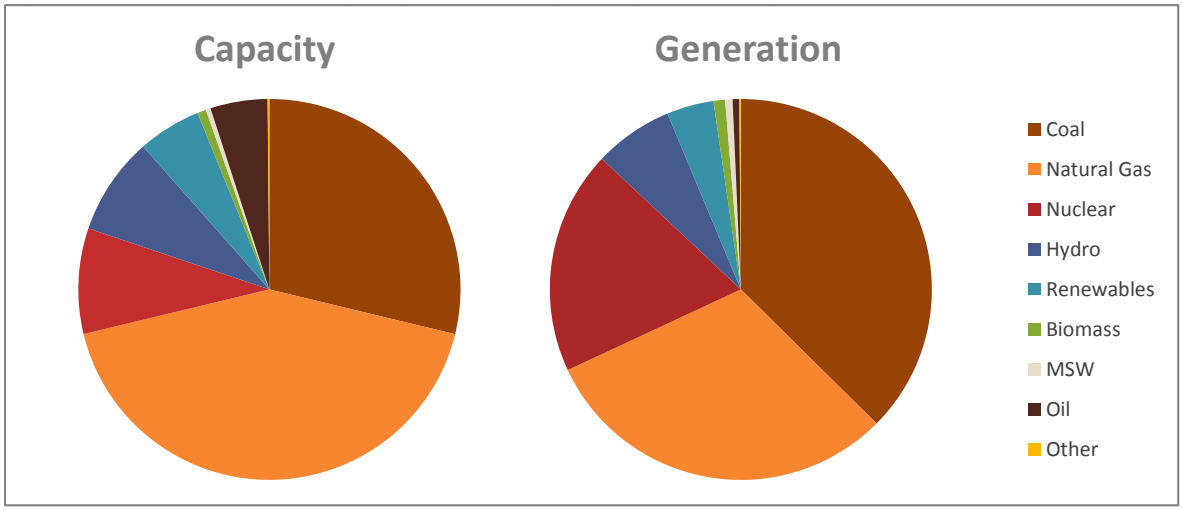
[2] Recent studies suggest that the lifecycle emission advantage that natural gas holds over coal is largely dependent on the amount of methane that leaks during the extraction and distribution phases of natural gas production.

[3] Capacity factors describe the relationship between an electrical generating unit's (EGU's) actual output versus the potential output if the EGU ran at 100 percent capacity (full output) over a full year (8760 hours).

2. HISTORICAL CONTEXT FOR THE CAPACITY MIX

In 2012, more than half of the electric power generation in the US came from fossil fuels, with coal and natural gas at 37 percent and 31 percent of total generation, respectively. In terms of capacity (i.e., megawatts) the figures are different, because coal plants typically run more than gas plants do (with coal having 30 percent of the total capacity and natural gas having 42 percent). Figure 1 shows the US capacity and energy mixes in 2012, while Figure 2 shows the average capacity factors for the various resources in 2012. Without building new natural gas capacity, it is possible to change the generation mix by dispatching the system differently – for example, energy from underutilized existing gas capacity can displace energy from coal.

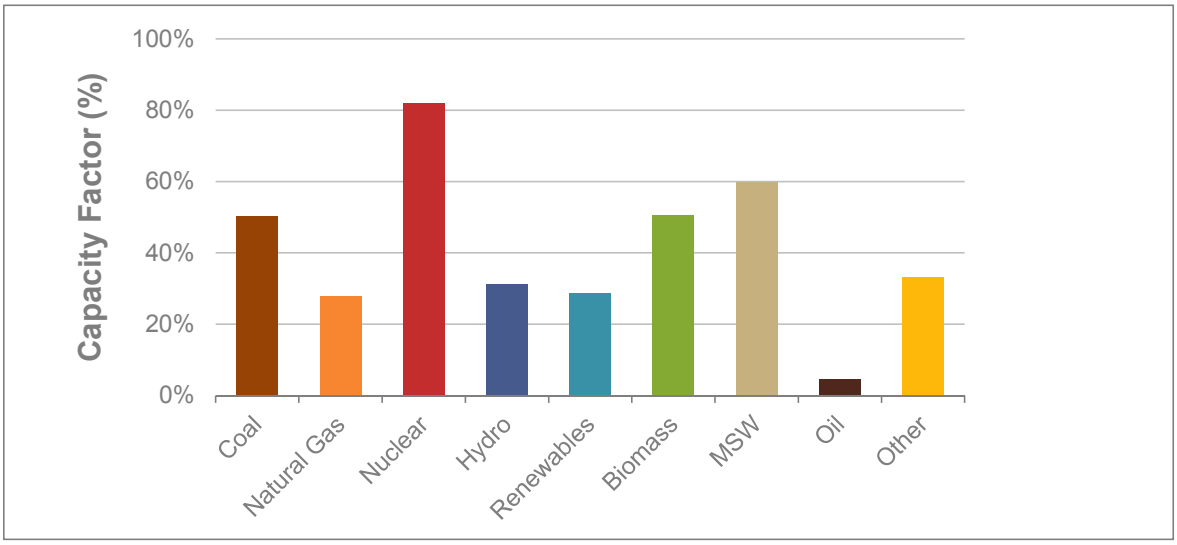
Figure 1. United States 2012 capacity and electric power generation by resource.



Source: The capacity and generation data from EIA 860 2012 and EIA 923 2012[4]

[4] "Renewables" includes wind, solar, and geothermal resources. "Other" includes resources such as tires and waste heat.

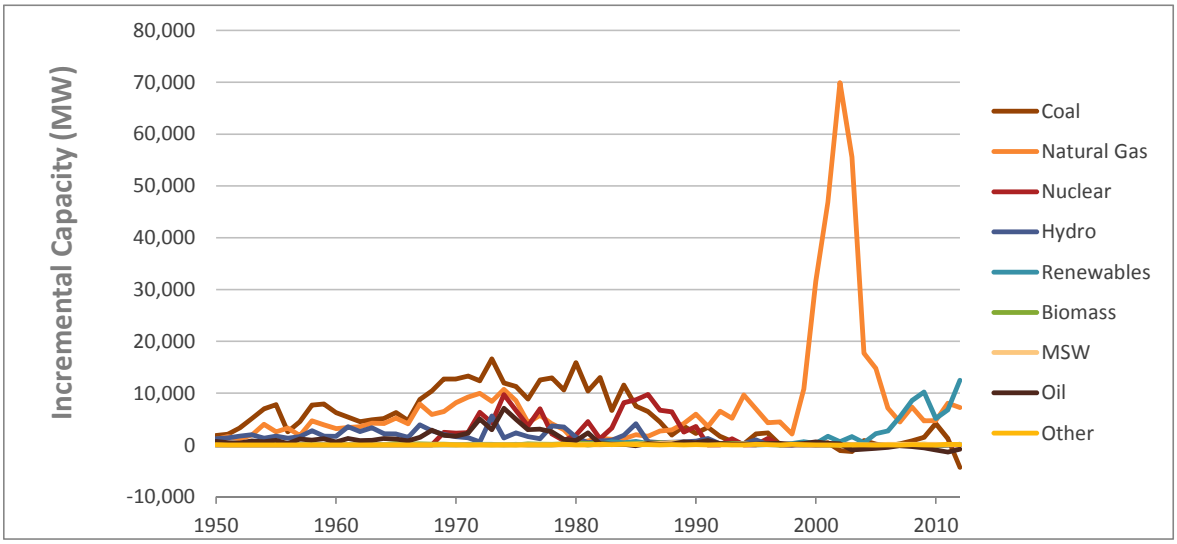
Figure 2. Annual average capacity factor for various electric-generating technologies for 2012.



Source: Calculated from EIA 860 2012 and EIA 923 2012[4]

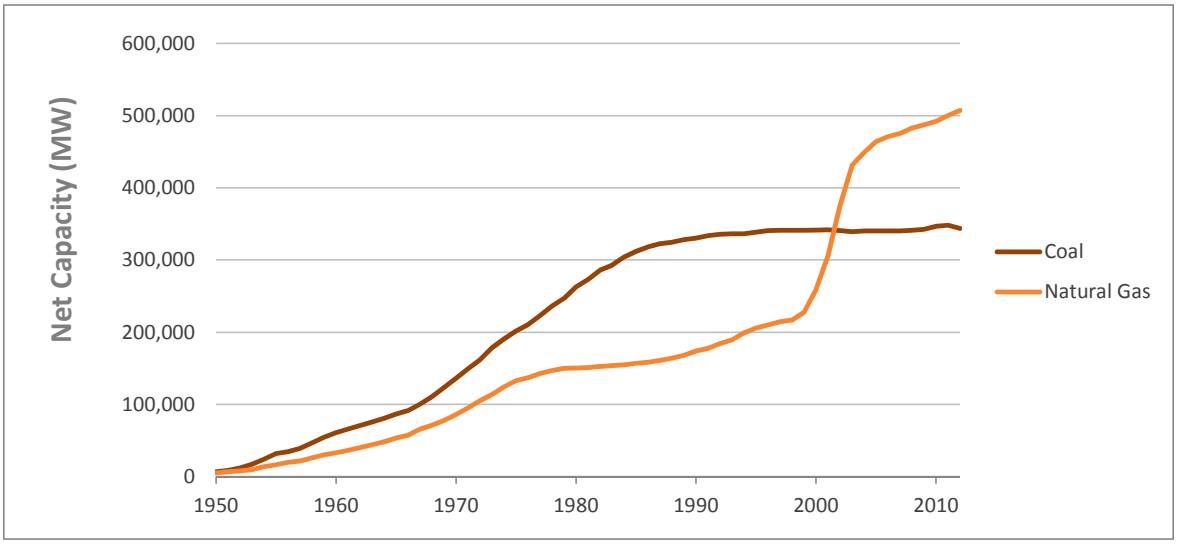
Figure 3 shows the trends of net capacity additions in the US since 1950. Nearly all of the coal capacity was added to the grid between 1950 and 1990, with a peak year for additions of 1973. On average, the natural gas-fired generating capacity is much newer, with about 245,000 MW added between 1995 and 2005. Figure 4 indicates that in 2002, the total natural gas-fired capacity surpassed the total coal-fired capacity for the first time. The owners of the natural gas units typically constructed them expecting to operate them at capacity factors much higher than the recent actual operation. This gas capacity is capable of generating much more electricity than it currently does. In the longer term it will be essential for the US to add new renewable generating capacity in order to meet greenhouse gas reduction goals. But in the near term, natural gas presents a cost-effective opportunity to reduce costs and emissions simultaneously.

Figure 3. Net capacity installed and retired in the United States by resource.



Source: EIA 860, 2001-2012. Net capacity additions for a given year include both new capacity installed and old capacity retired.

Figure 4. Total capacity of coal and natural gas in the US.



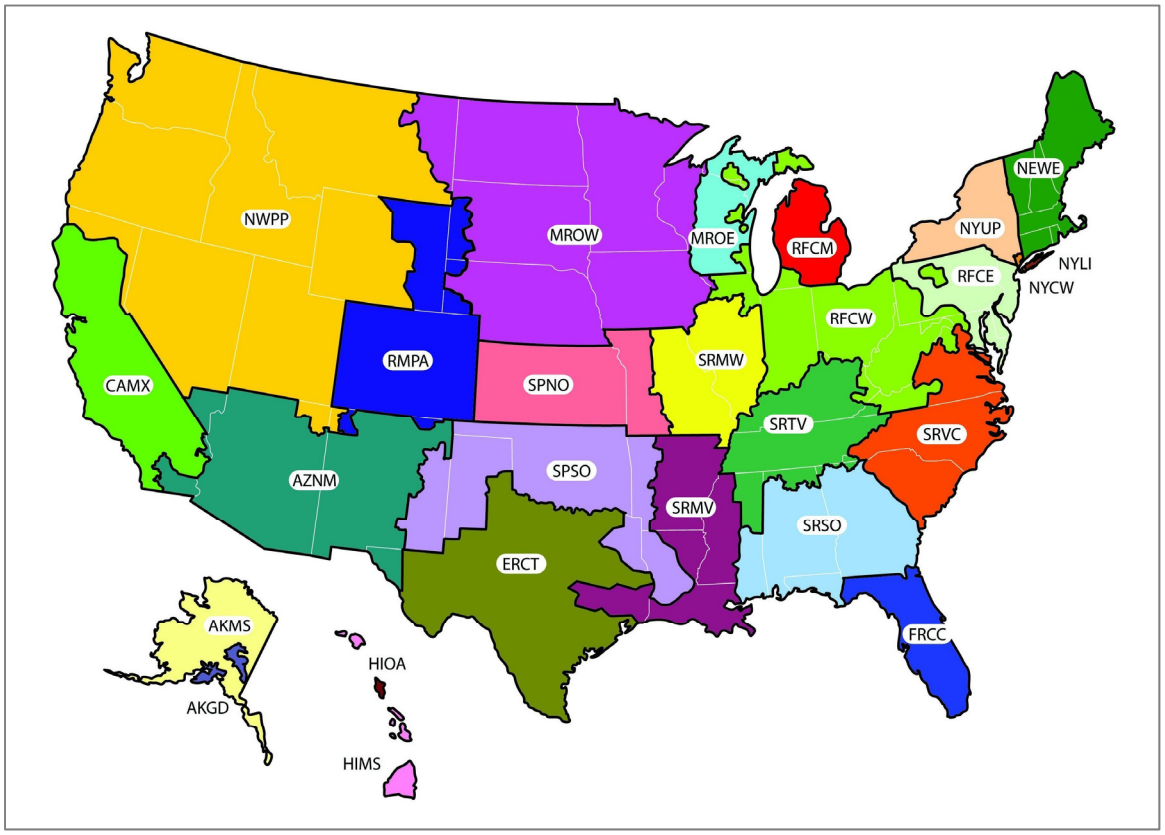
Source: EIA 860 2001-2012. Net capacity additions for a given year include both new capacity installed and old capacity retired.

3. REGIONAL RESULTS

Synapse has evaluated the available, unused natural gas generation that could feasibly be used to displace coal generation on a region-by-region basis. This analysis was conducted on a unit-by-unit basis; however, results are compiled at the scale of eGRID subregions and ISOs/RTOs, approximating regional power markets. Figure 5 shows a map of the 22 regions used in the eGRID subregion-level analysis. Table 1 shows the available, unused combined cycle gas-fired generation capacity, assuming every such

plant in the United States could operate at a capacity factor of 80 percent, broken down by electrical subregions.[5] The analysis conducted in this report focuses specifically on the combined cycle gas generators (also known as "CC" units), because those are typically the more efficient units, and are therefore more cost-effective to operate. In 2012, natural gas CC units made up approximately 53 percent of total natural gas-fired capacity.[6] If other, less efficient types of gas capacity were included in the analysis, then the potential quantities of coal displacement would be substantially higher, but the cost of displacement per MWh (and therefore per ton of CO_2) would be higher.

Figure 5. eGRID subregions, used to define electricity market regions in this analysis.



Source: EPA eGRID 2010

[5] A similar table indicating data on natural gas combined cycle units by ISO/RTO is shown in Appendix A.

[6] Natural gas combustion turbines ("CT"s) made up approximately 33 percent of the natural gas-fired capacity in 2012. The remaining capacity was made up of steam and other types of generating units.

Table 1. Actual 2012 generation from natural gas combined cycle units compared to potential generation assuming a nation-wide 80% capacity factor. Actual 2012 generation from coal units is shown for reference.

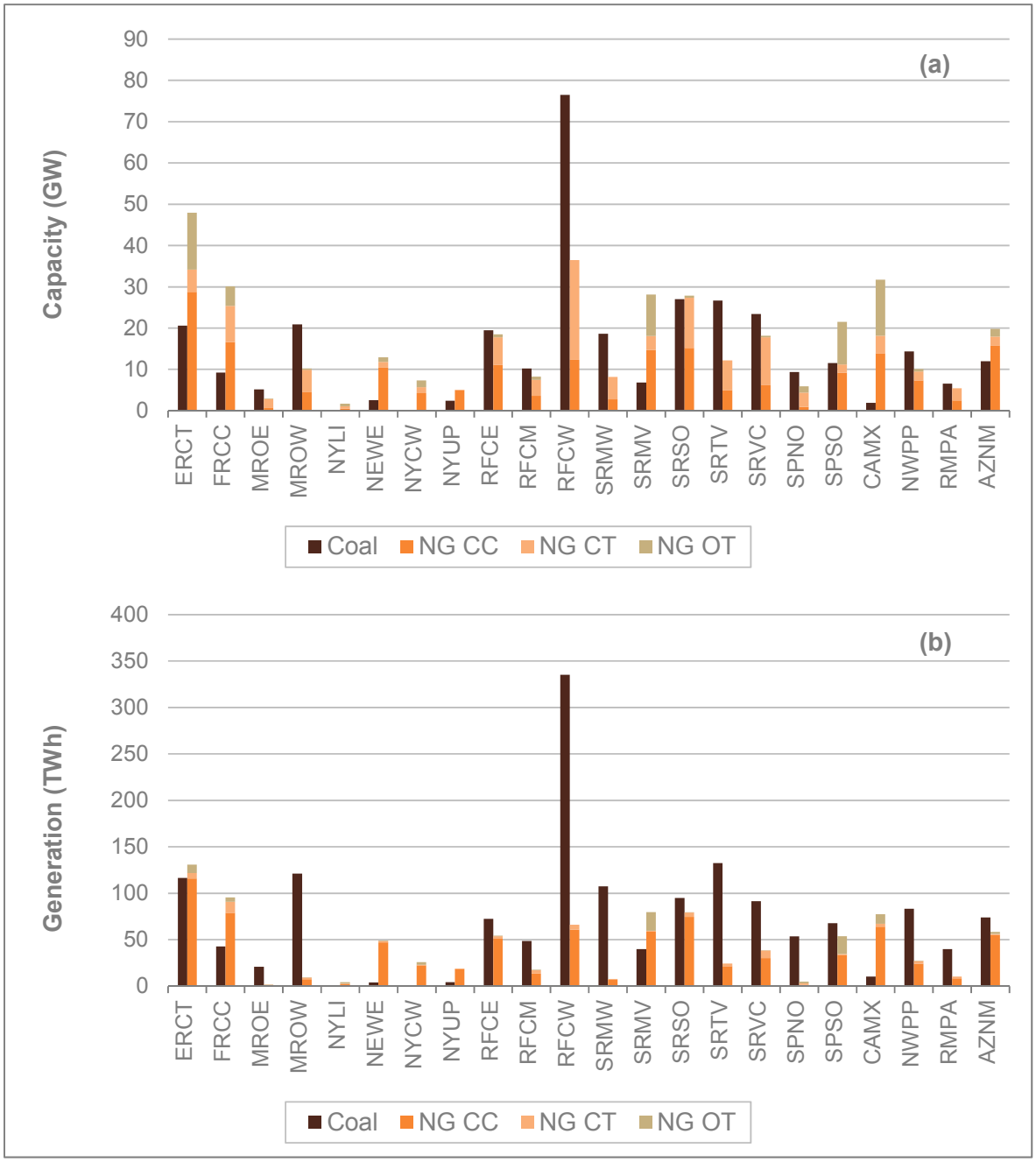
eGRID Subregion		Natural Gas Combined Cycle						Coal
		Num. of Units	Capacity (GW)	Generation in 2012 (TWh)	Average Capacity Factor	Potential Generation (TWh)	Incremental Potential (TWh)	Generation in 2012 (TWh)
ERCT	ERCOT All	123	29	116	46%	202	86	117
FRCC	FRCC All	73	17	79	54%	116	37	43
MROE	MRO East	2	1	1	21%	5	3	21
MROW	MRO West	19	5	8	19%	32	25	121
NYLI	NPCC Long Island	7	1	2	48%	4	1	0
NEWE	NPCC New England	54	10	47	52%	73	26	4
NYCW	NPCC NYC/Westchester	19	4	22	60%	30	7	0
NYUP	NPCC Upstate NY	35	5	19	43%	35	16	4
RFCE	RFC East	63	11	51	53%	78	27	73
RFCM	RFC Michigan	26	4	14	44%	25	11	49
RFCW	RFC West	49	12	61	56%	87	26	335
SRMW	SERC Midwest	10	3	7	28%	20	13	108
SRMV	SERC Mississippi Valley	57	15	59	46%	103	44	40
SRSO	SERC South	56	15	75	56%	107	32	95
SRTV	SERC Tennessee Valley	17	5	22	50%	35	13	133
SRVC	SERC Virginia/Carolina	31	6	30	55%	44	14	92
SPNO	SPP North	3	1	2	22%	6	5	54
SPSO	SPP South	34	9	34	42%	64	31	68
CAMX	WECC California	64	14	64	52%	98	34	10
NWPP	WECC Northwest	28	7	24	38%	52	27	83
RMPA	WECC Rockies	17	3	8	38%	18	9	40
AZNM	WECC Southwest	62	16	55	40%	111	55	74
Total	Contiguous USA	849	191	801	48%	1,345	544	1,563

Source: EPA Air Market Programs dataset 2012, EIA 860 2011

Figure 6 shows the breakdown of generating capacity and electricity output by fuel and boiler type for each eGRID subregion. There are some regions that are very heavily dependent upon coal-fired generation, and in which there are only limited opportunities to displace significant amounts of such coal-fired generation by gas-fired generation. For example, in the MROW region (northern Midwest states), the incremental potential additional generation from existing natural gas CCs is 25 TWh, roughly 21 percent of the total annual coal generation. Such coal-heavy regions include the Western PJM Interconnect (RFCW): Illinois, Indiana, Ohio, and West Virginia; the Tennessee Valley Authority: Kentucky and Tennessee (SRTV); the northern Midwest states (MROW) of Iowa, Minnesota, North Dakota, South Dakota and Nebraska; Missouri and Kansas (SRMW and SPNO); and Colorado (RMPA).

The two smallest eGrid subregions, New York Long Island and NY City/Westchester, do not have any coal units. As a result, the analysis showed no difference in generation when natural gas CC units are fully utilized.

Figure 6. Coal and gas (a) generating capacity and (b) electricity production by region in 2012. Other types of natural gas capacity (combustion turbine and other) are also shown for reference.

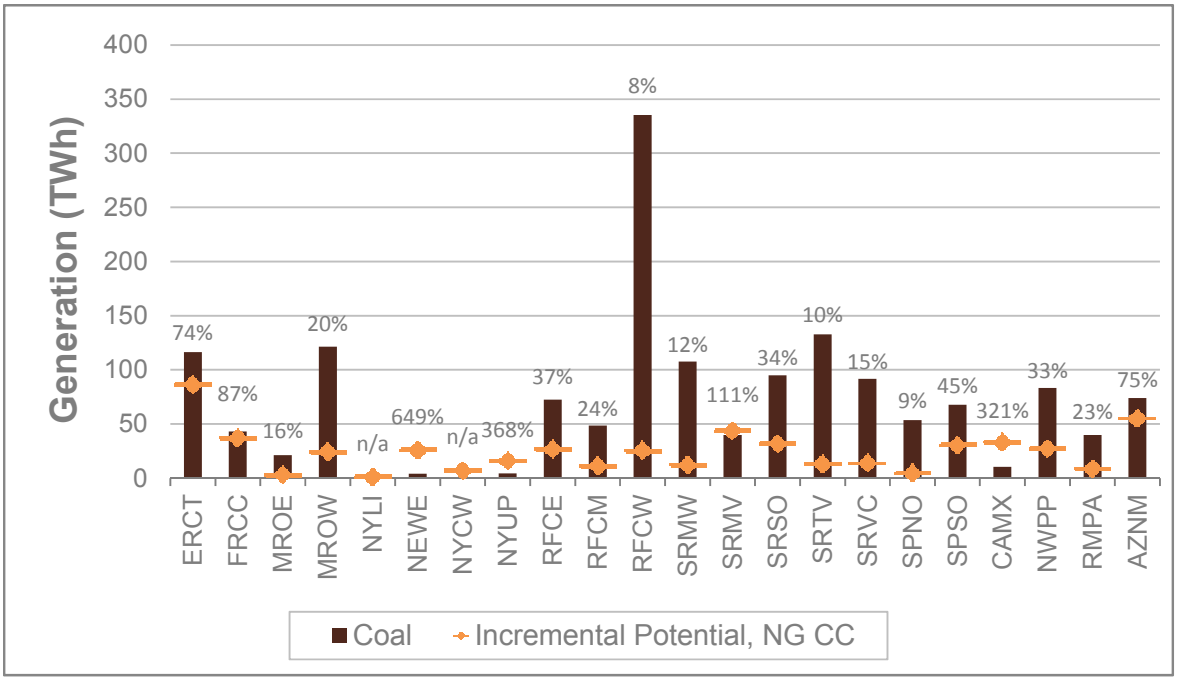


Source: EPA Air Markets Program Data 2012, EIA 860 2011

Figure 7 indicates that in other regions, there may be enough potentially available gas-fired generation to displace a third or more of the existing coal generation. Regions where this applies are Texas (ERCT), Florida (FRCC), Louisiana and Mississippi (SRMV), Alabama and Georgia (SRSO), Arizona and New Mexico (AZNM), Delaware, Maryland, New Jersey, Pennsylvania, and Washington DC (RFCE) and Oklahoma

(SPSO), as well as New York (NYUP), New England (NEWE), and California (CAMX). Nation-wide, there is enough potentially available gas-fired generation to displace 35 percent of coal generation.

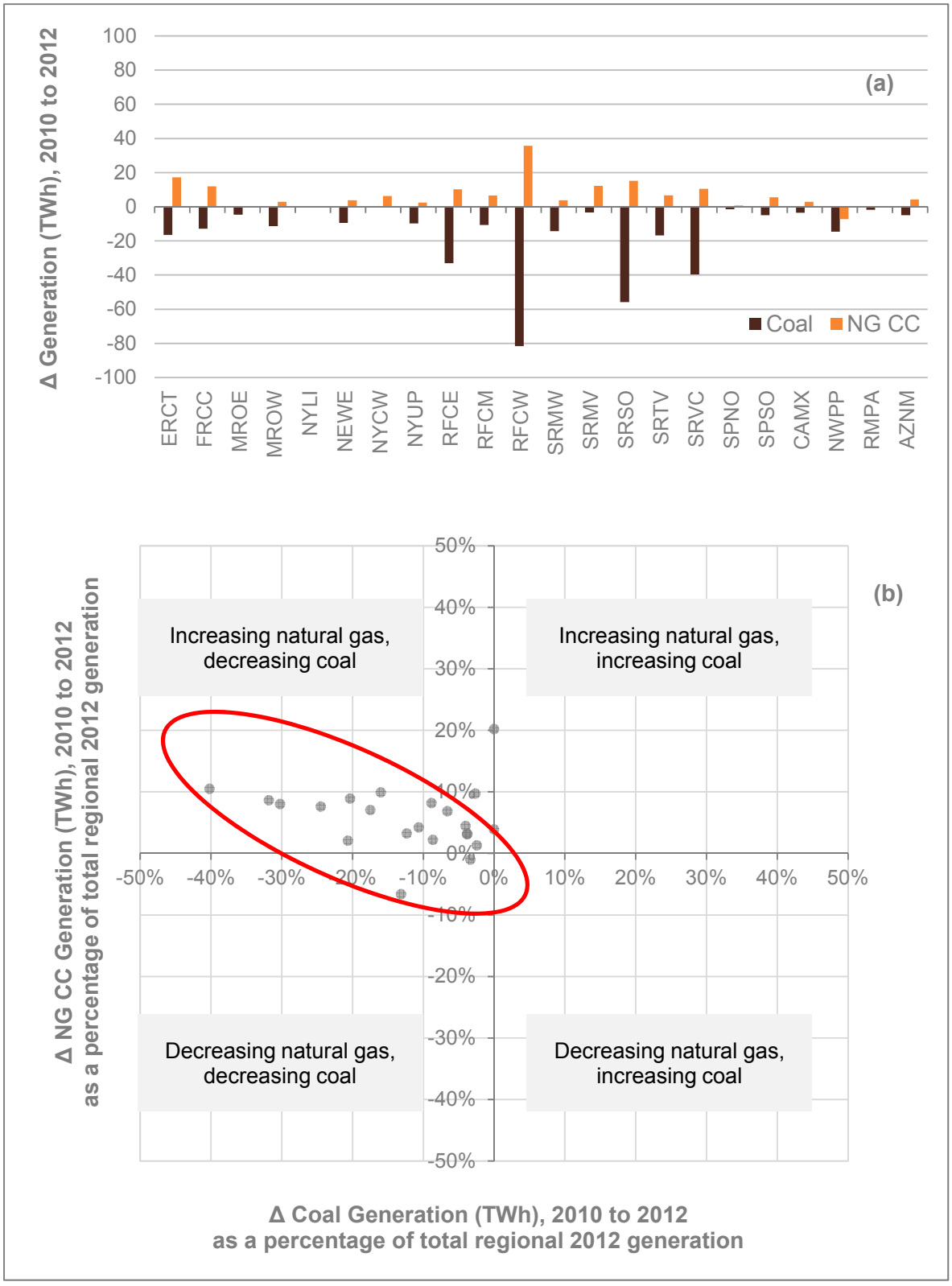
Figure 7. The total coal electricity production by region in 2012, along with an indicator of the incremental potential generation available from natural gas CC units, based on the regional values in Table 1. This indicator serves as a benchmark of how much of a region's total coal generation could be offset if all CC units used at least an 80% capacity factor. Also shown are percentages indicating the percent of coal potentially displaced by CC units running with an 80% capacity factor.



Source: EPA Air Market Programs dataset 2012, EIA 860 2011

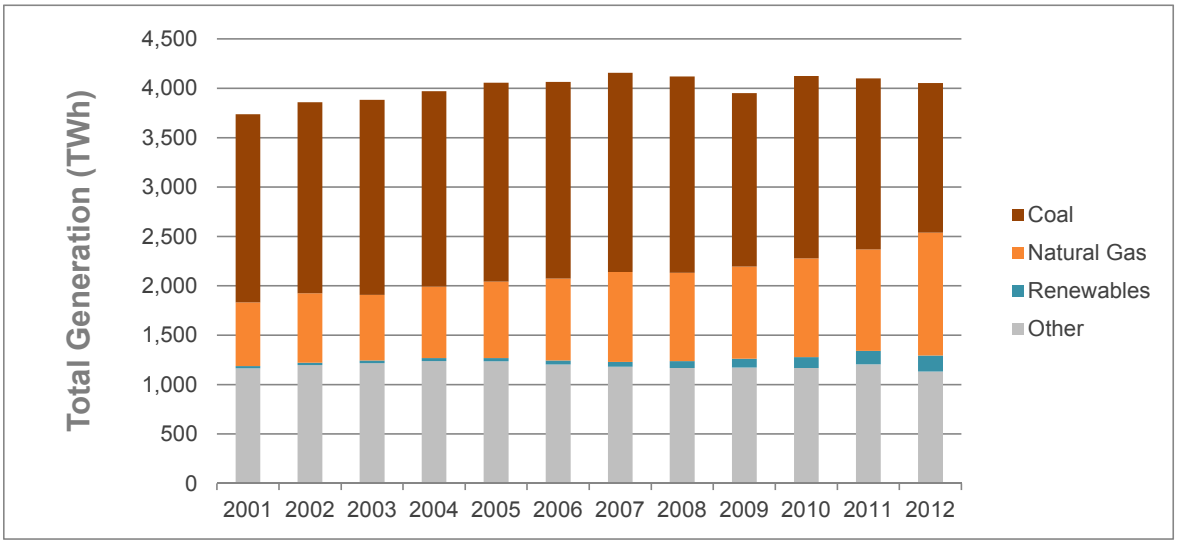
Figure 8 indicates the change in electricity generation by the two different resources between 2008 and 2012 on a regional level. Of the 20 regions with both coal and natural gas CC units, eighteen experienced both a decrease in coal generation and an increase in natural gas CC generation. Two other regions, RMPA and NWPP, experienced decreases in both types of generation. In Figure 8 (b), these deltas are divided by each region's total 2012 generation, and are then mapped on a Cartesian plane. Though this figure illustrates how coal generation is decreasing at the same time natural gas CC generation is increasing, it also shows that in many regions, the rate of loss in coal generation is less than the rate of increase in natural gas generation. This implies that natural gas CC units are not the only resource displacing coal; this "other" displacement could be coming from other supply-side resources, or possibly reductions in demand due to the global economic recession or gains in energy efficiency. Figure 9 details how annual nationwide generation has declined by 2 percent between 2010 and 2012, and how generation from renewables has risen by 45 percent over this same period.

Figure 8. (a) Depicts the change in coal and natural gas CC generation by region; (b) indicates that for the majority of regions, coal generation is decreasing at a faster rate than natural gas CC generation is increasing.



Source: EPA Air Markets Program Data, 2010-2012

Figure 9. Change in generation of all types of units nationwide, 2001-2012.

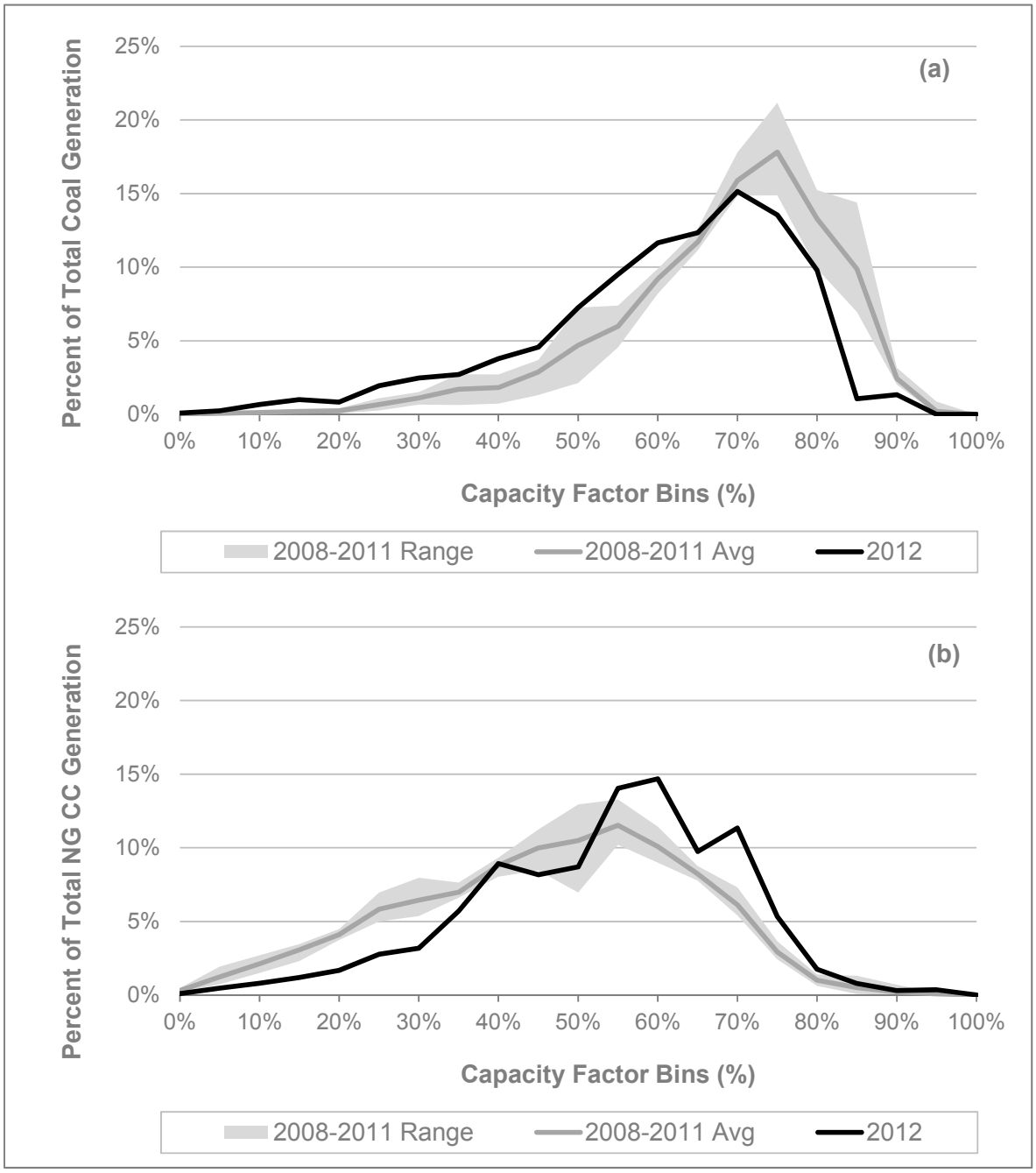


Source: EIA 923 2001-2012

Figure 10 shows that not only is the quantity of coal generation changing due to increases in natural gas generation, but that this displacement is also affecting the generation profile of coal units. Both charts plot, as histograms, the distribution of generation against capacity factor in bins of 10 percent increments. The light gray area represents the historic range for 2008 through 2011, with the dark gray line showing the average for those years. The top chart indicates the coal generation profiles for 2008 through 2012, while the bottom chart displays the same metrics for natural gas CC generation. In both (a) and (b), the x-axis indicates bins of capacity factors, while the y-axis indicates the amount of generation (as a percent of total annual generation from that resource) being delivered from units at each capacity factor.

On average, between 2008 and 2011, 78 percent of coal generation was produced from units operating at capacity factors between 60-90 percent. Most coal capacity operated as often as possible, and was only limited from achieving even higher capacity factors because of forced and scheduled outages. In 2012, this "drop-off" point shifted further away from 100 percent. At the same time, more of the annual coal generation came from units operating at lower capacity factors; in 2012, only 64 percent of coal generation came from units operating at capacity factors between 60-90 percent Figure 10 (b) indicates that an opposite trend holds true for natural gas CC generation. From 2008 to 2012, there has been a shift as more natural gas CC units generated electricity at higher capacity factors. On average between 2008 and 2011, 29 percent of natural gas CC generation came from units operating at capacity factors between 60-90 percent; in 2012, 44 percent of natural gas CC generation came from units operating at these same capacity factors.

Figure 10. Change in coal and natural gas CC generation histograms, 2008 to 2012.



Source: EPA Air Markets Program Data, 2008-2012, EIA 860 2011

4. HOURLY REPLACEMENT

4.1. Methodology

There are many reasons why an individual gas plant might not be able to produce electricity at the 80 percent capacity factor used as a standard in the above analysis. For example, access to gas supply and pipeline capacity; environmental constraints; warranty conditions on the turbines; or other political, economic, or regulatory restrictions may impact the ability of natural gas CC generation to displace coal generation. Additionally, in real electricity markets, generating units must produce electricity exactly when it is needed, meaning that at peak times there may not be enough natural gas capacity to meet regional demand. In order to form a more detailed estimate of the actual ability of natural gas CCs to replace coal in all hours, Synapse took the following steps:

1. Downloaded hourly data from the EPA Air Markets dataset, then aggregated the data by eGRID subregion.

2. Calculated values for total annual generation and maximum hourly load for coal, natural gas CCs, and total fossil generation.

3. In each hour, calculated a maximum hypothetical value for natural gas CCs by multiplying the natural gas CC maximum load by 80 percent. In a given hour, if the actual natural gas CC generation exceeded this hypothetical value, the actual value was used. Otherwise, the hypothetical value was used. In these cases, Synapse subtracted the same amount of incremental generation from the hourly coal generation.

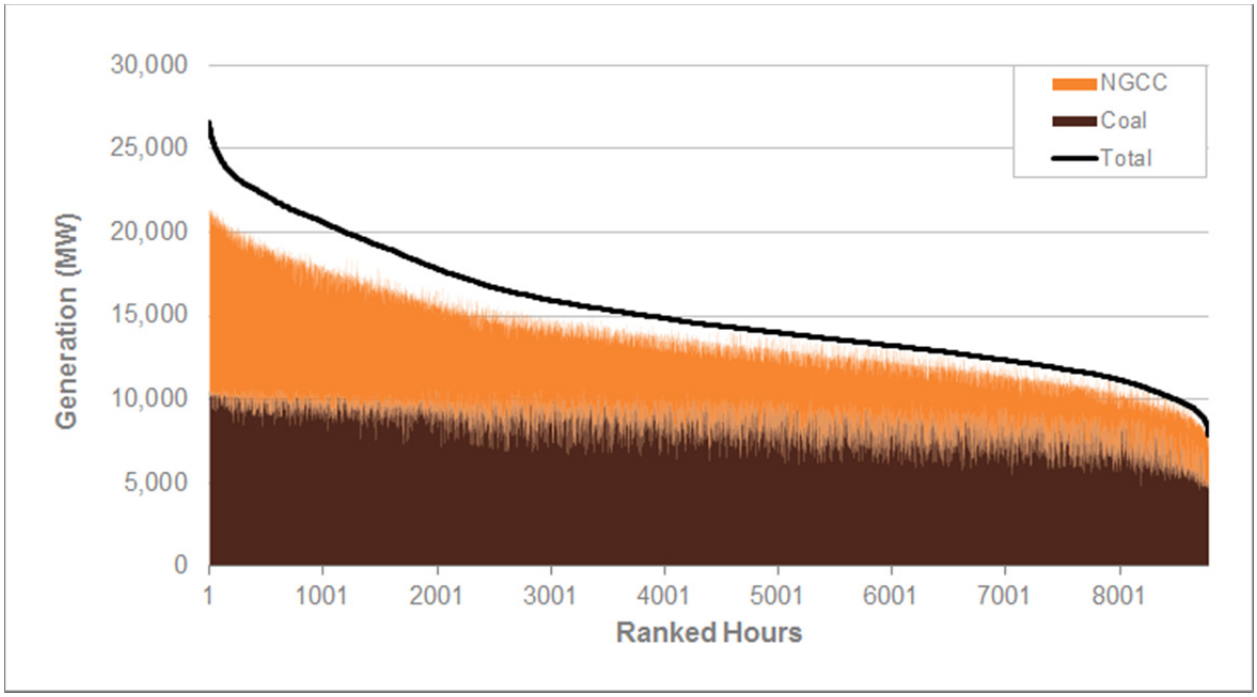
4. Sorted all hours high to low by generation, creating 22 regional annual load curves.

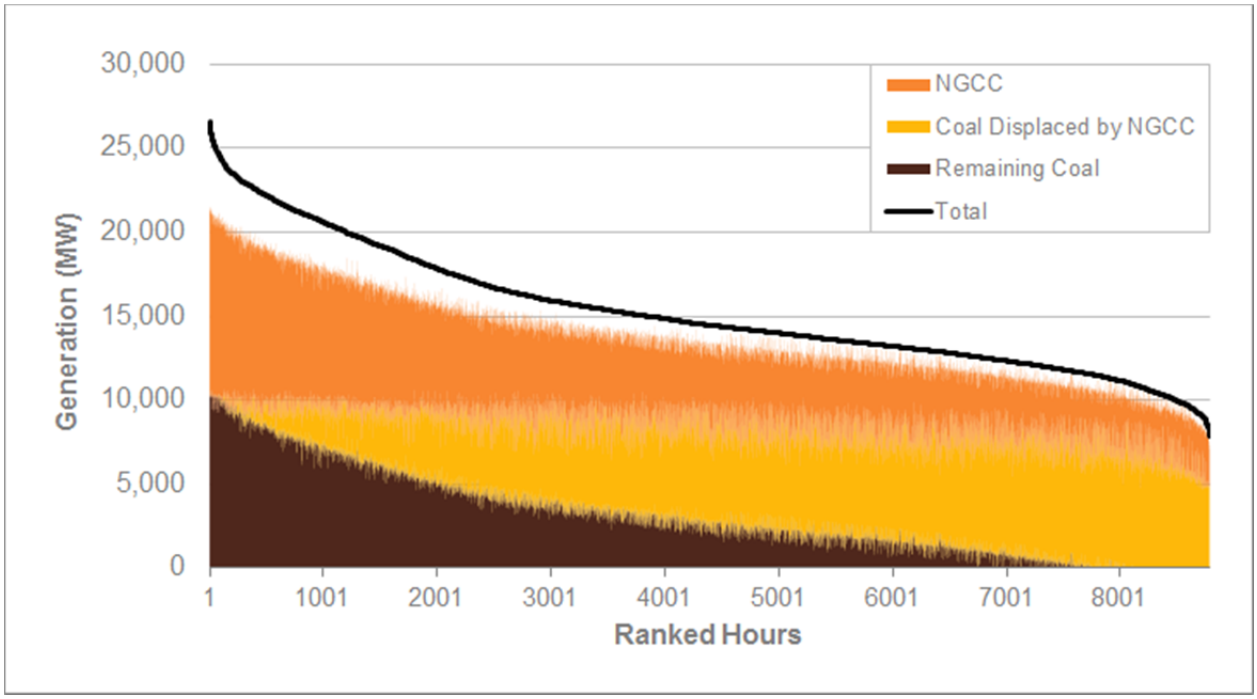
4.2. Findings

The following section details the ability for natural gas to meet the regional hourly demand in each of the eGRID subregions. The graphs below illustrate the load distribution curves for each of the eGrid subregions. Each of the following pages displays three figures. The first is a summary table, which describes what eGrid subregion is being analyzed and several critical metrics used for analysis. The first of the two graphs shows the total fossil use, natural gas CC use, and coal use for 2012. The gap between the black line and the shaded area represents generation from other emitting sources not used in this analysis, such as biomass and natural gas CTs. The second of the two graphs replicates the generation curve using the methodology outlined in the above section and shows how much coal would be displaced by fully utilizing existing natural gas CC capacity (under the assumptions laid out in this report). Generally speaking, this displaced coal occurs at the lower demand hours (on the right side of the load distribution curves).

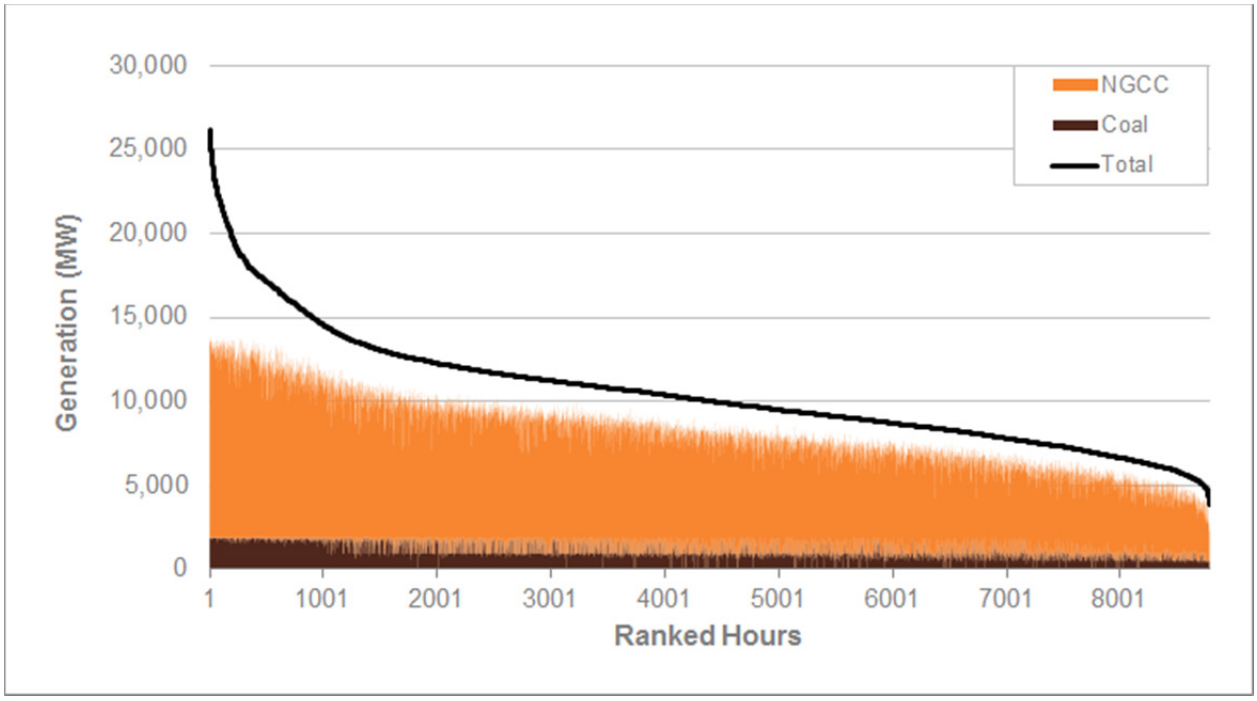
The two smallest eGrid subregions, New York Long Island and NY City/Westchester, do not have any coal units. As a result, the analysis showed no difference in generation when natural gas plants are fully utilized. These two subregions' load distribution curves are shown below for completeness.

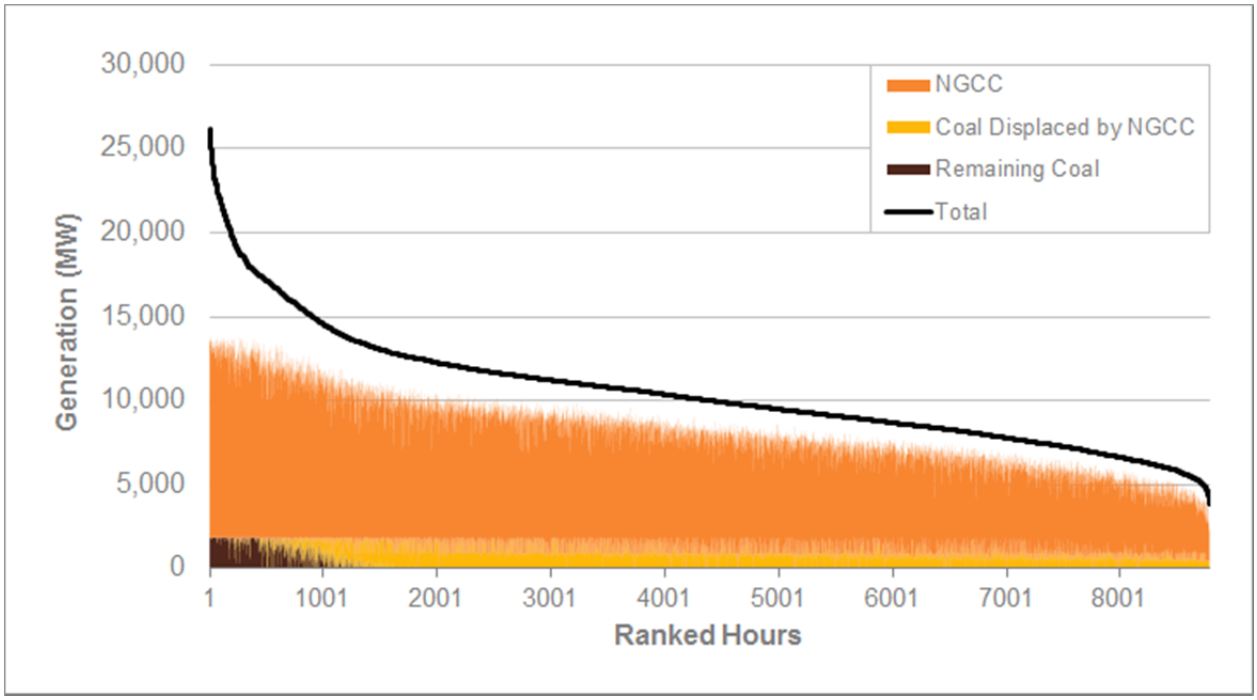
AZNM: Southwest	Peak Load (MW)	Generation (GWh)	% of Total Generation	Capacity Factor	% of Total Days
Total Fossil (2012)	26,614	134,222			
Coal (2012)	10,682	73,941	55%	71%	100%
Natural Gas CC (2012)	11,204	46,310	35%	40%	100%
Coal Displaced by NGCC		45,672	34%		
Remaining Coal		28,269	21%	27%	89%
Total Natural Gas CC Potential		91,982	69%	79%	100%



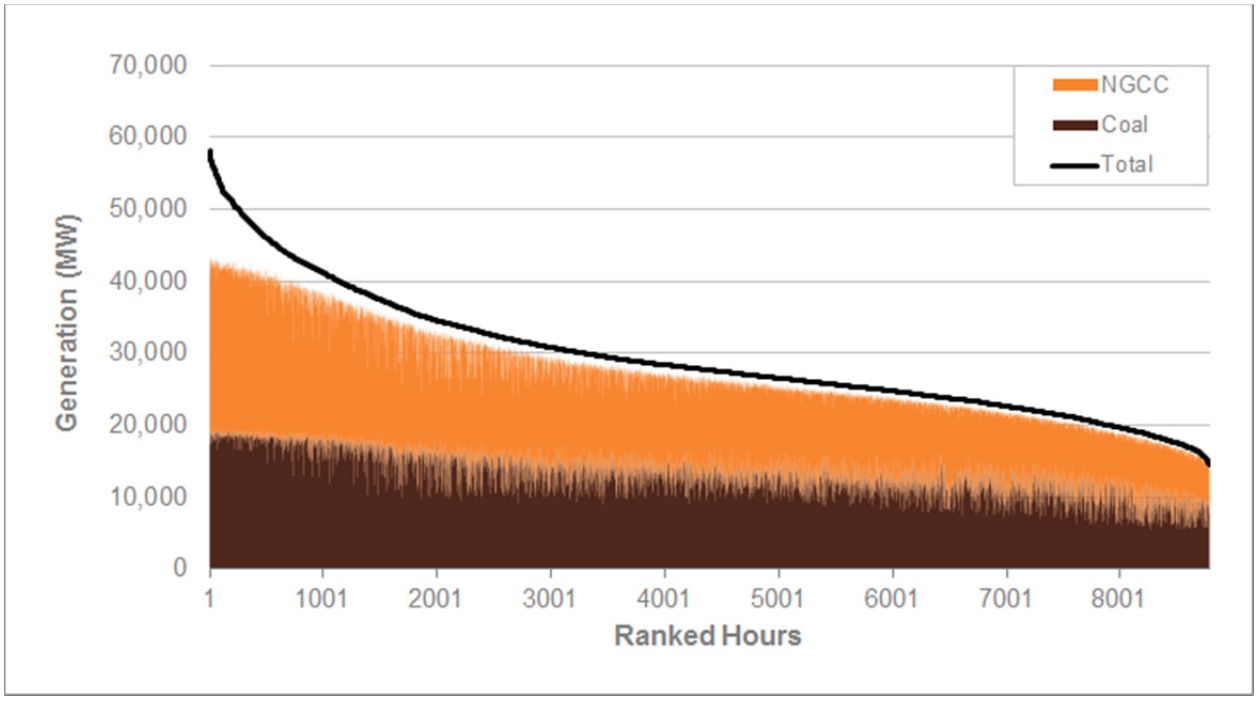


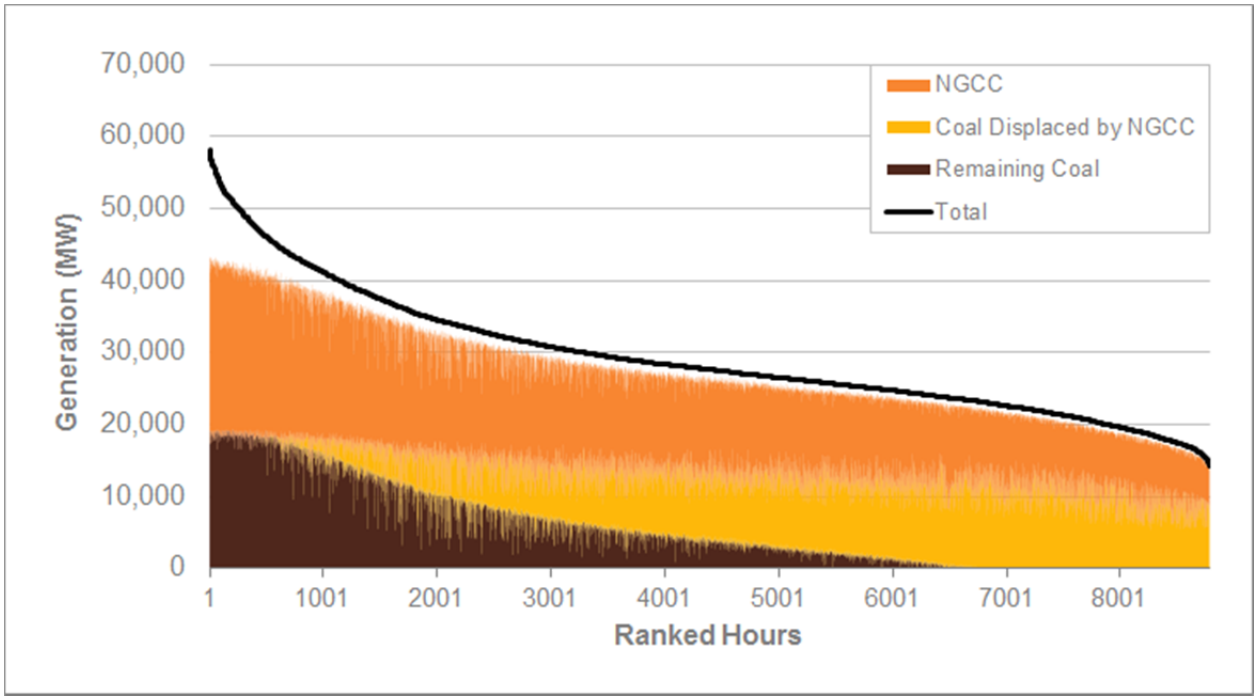
CAMX: California	Peak Load (MW)	Generation (GWh)	% of Total Generation	Capacity Factor	% of Total Days
Total Fossil (2012)	26,197	92,560			
Coal (2012)	1,899	10,455	11%	63%	99%
Natural Gas CC (2012)	11,926	60,922	66%	53%	100%
Coal Displaced by NGCC		8,842	10%		
Remaining Coal		1,613	2%	10%	15%
Total Natural Gas CC Potential		69,764	75%	61%	100%



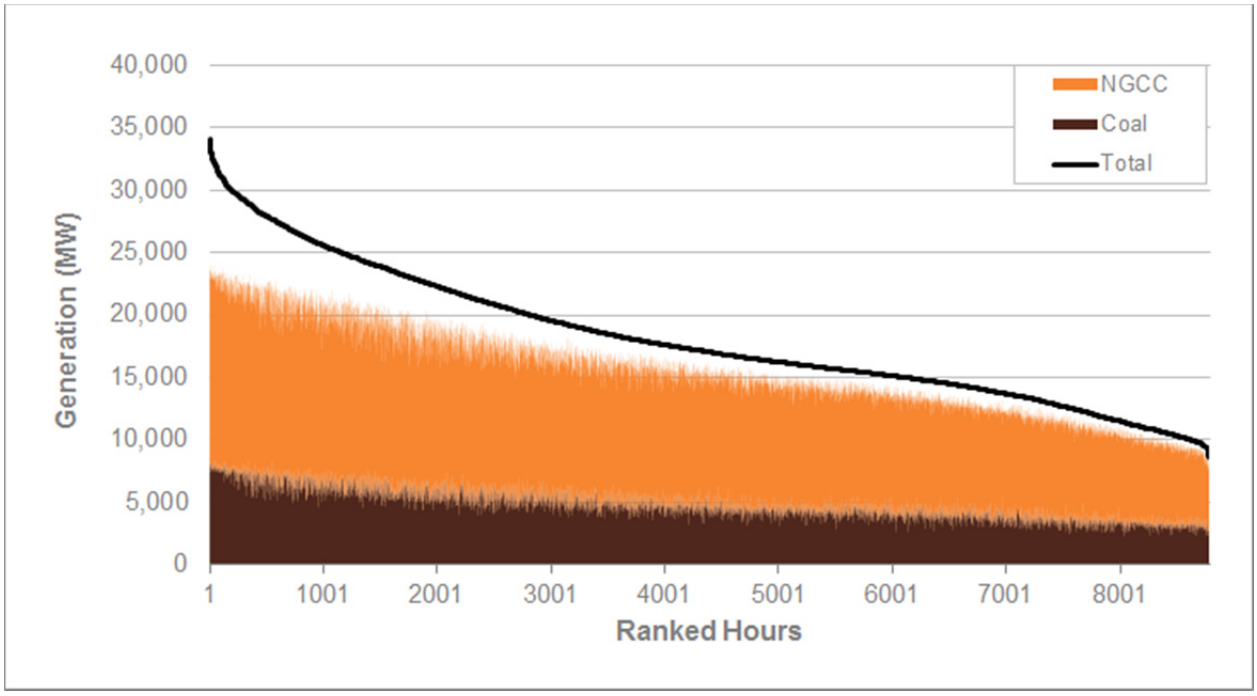


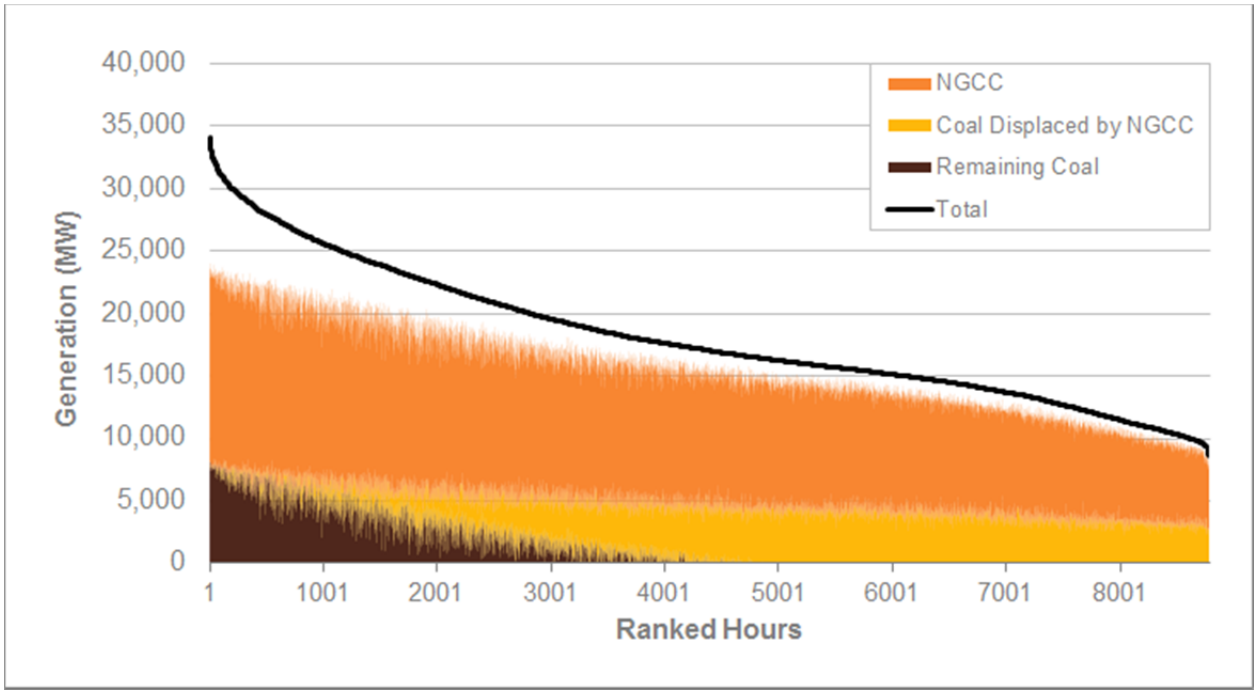
ERCT: ERCOT	Peak Load (MW)	Generation (GWh)	% of Total Generation	Capacity Factor	% of Total Days
Total Fossil (2012)	58,128	258,614			
Coal (2012)	19,361	116,574	45%	65%	100%
Natural Gas CC (2012)	24,217	121,780	47%	50%	100%
Coal Displaced by NGCC		67,443	26%		
Remaining Coal		49,130	19%	28%	76%
Total Natural Gas CC Potential		189,223	73%	78%	100%



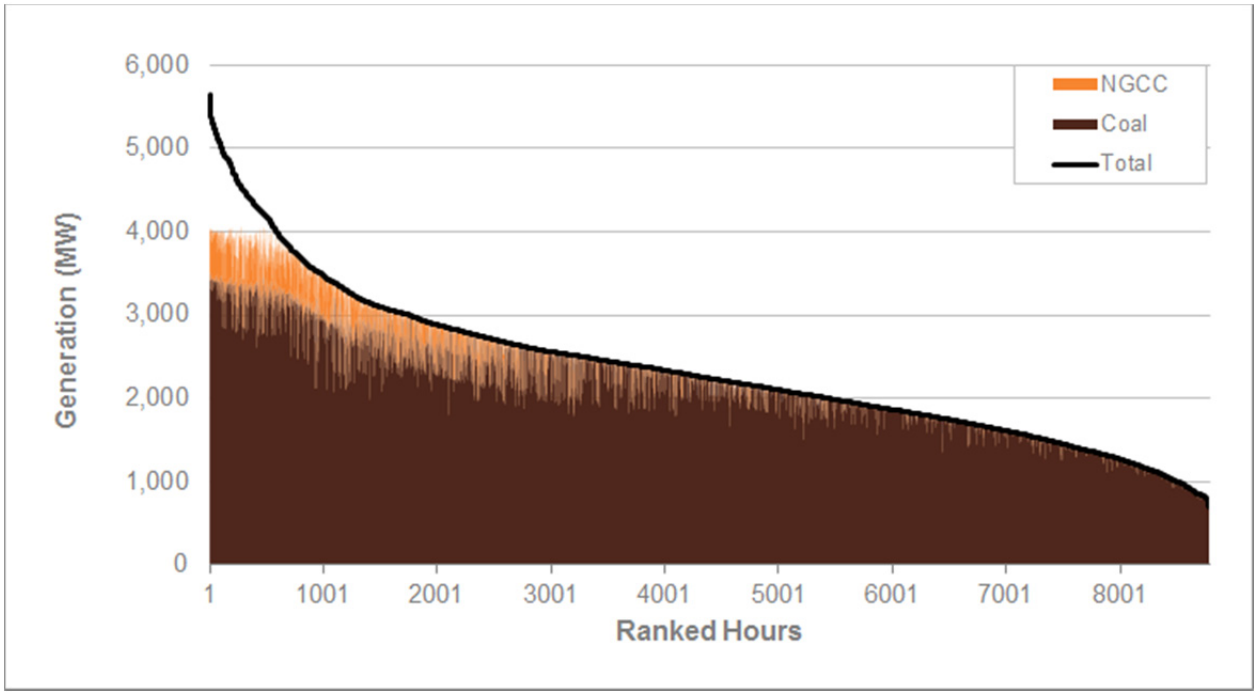


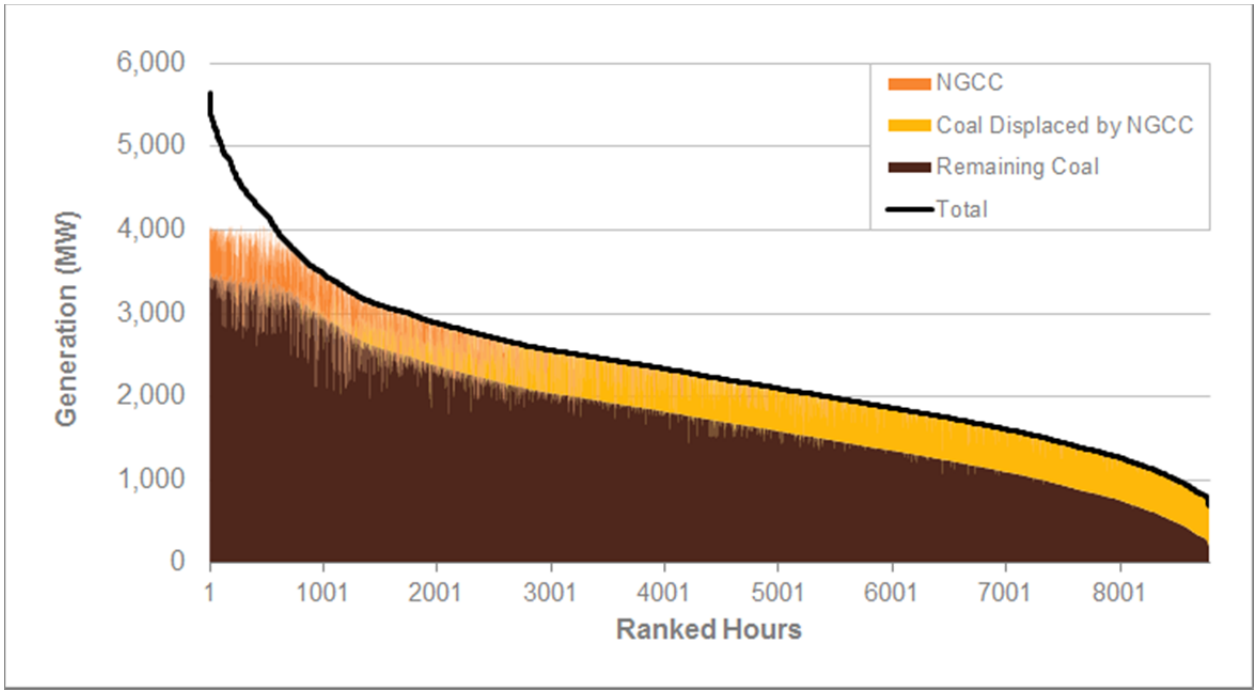
FRCC: FRCC	Peak Load (MW)	Generation (GWh)	% of Total Generation	Capacity Factor	% of Total Days
Total Fossil (2012)	34,109	159,396			
Coal (2012)	8,368	42,441	27%	53%	100%
Natural Gas CC (2012)	15,896	92,738	58%	56%	100%
Coal Displaced by NGCC		28,829	18%		
Remaining Coal		13,612	9%	17%	49%
Total Natural Gas CC Potential		121,567	76%	73%	100%



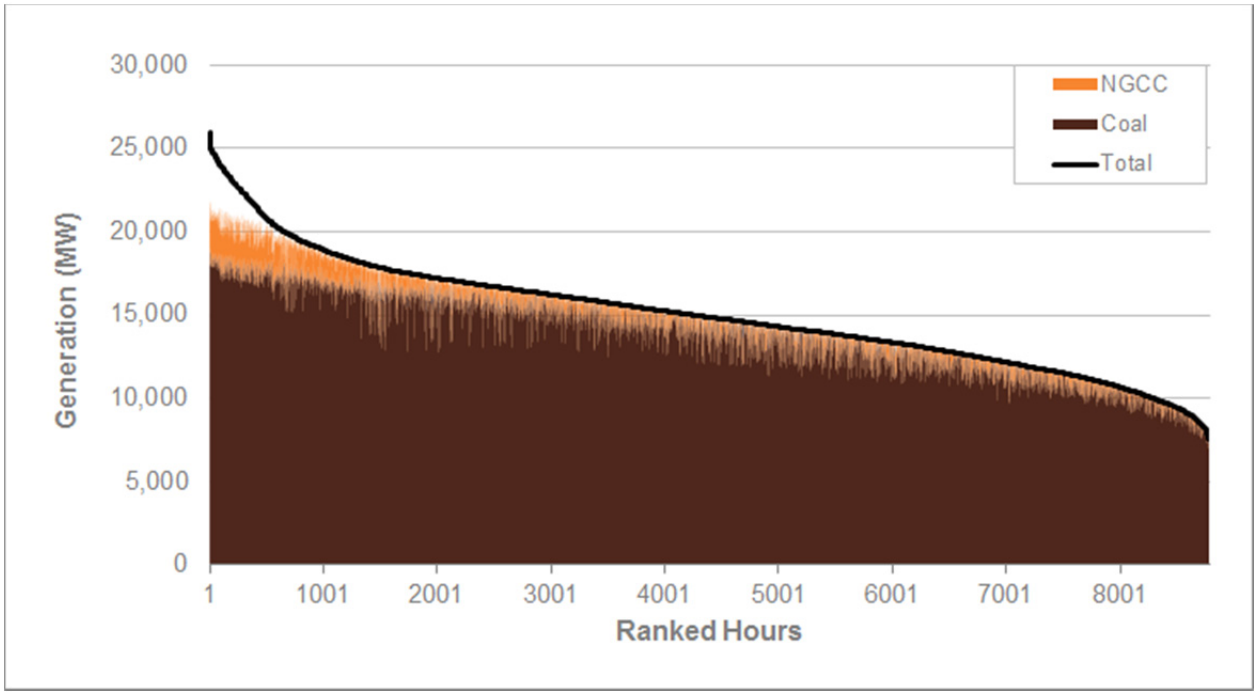


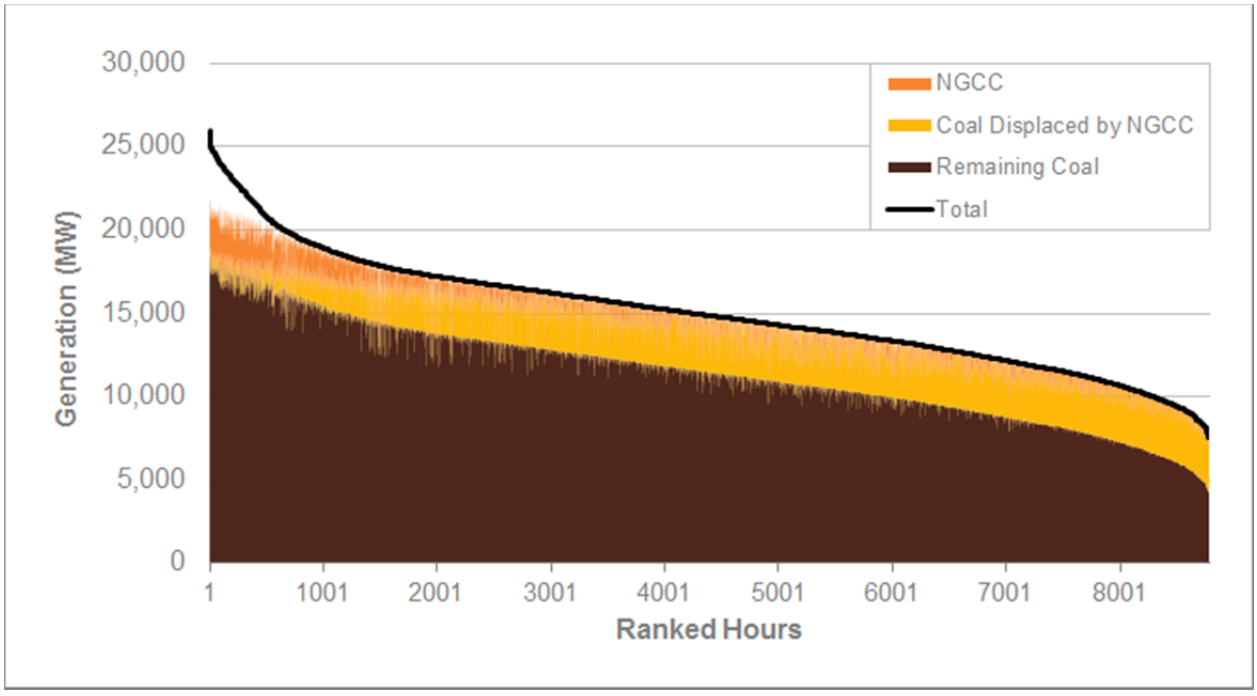
MROE: MRO East	Peak Load (MW)	Generation (GWh)	% of Total Generation	Capacity Factor	% of Total Days
Total Fossil (2012)	5,645	20,715			
Coal (2012)	3,512	18,847	91%	57%	100%
Natural Gas CC (2012)	637	1,262	6%	23%	36%
Coal Displaced by NGCC		3,287	16%		
Remaining Coal		15,560	75%	47%	100%
Total Natural Gas CC Potential		4,549	22%	81%	100%



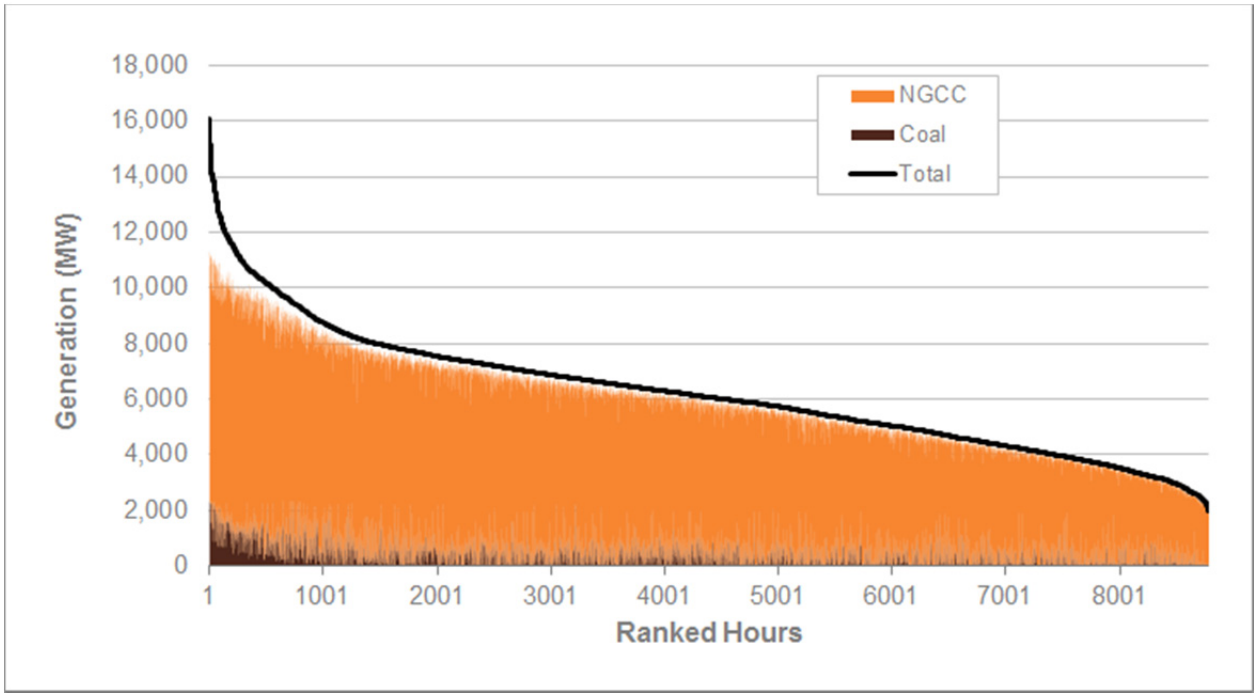


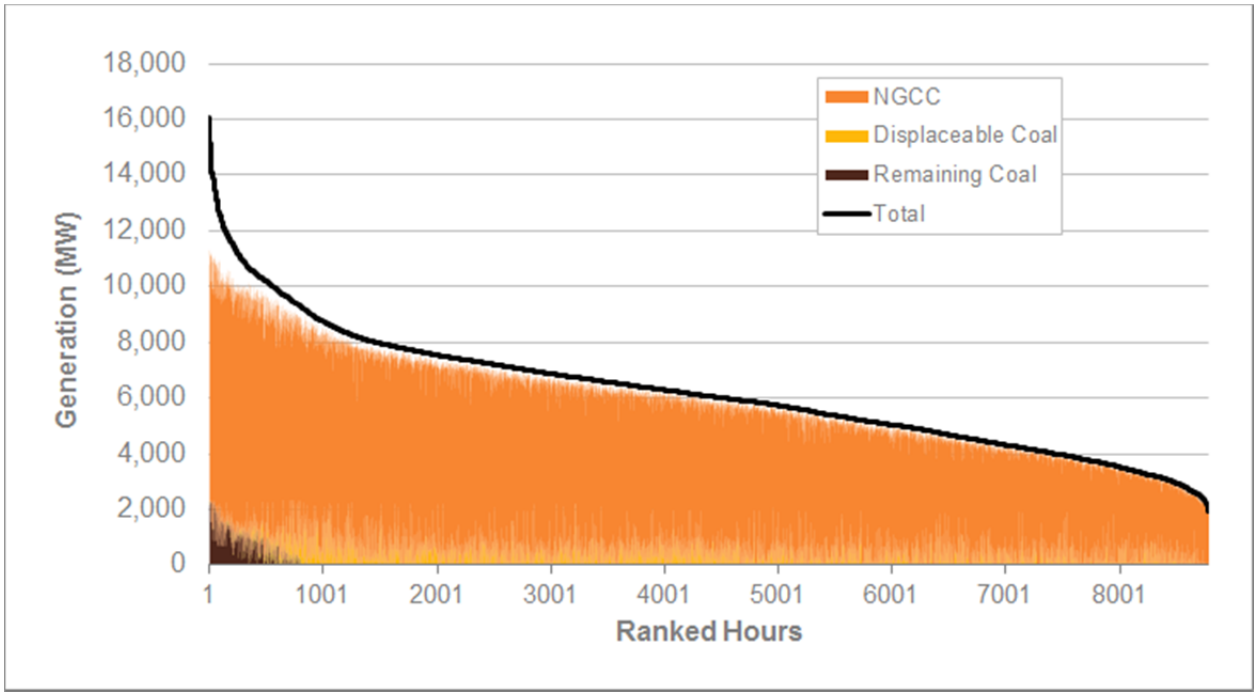
MROW: MRO West	Peak Load (MW)	Generation (GWh)	% of Total Generation	Capacity Factor	% of Total Days
Total Fossil (2012)	25,934	131,956			
Coal (2012)	19,006	121,777	92%	67%	100%
Natural Gas CC (2012)	2,894	7,393	6%	20%	79%
Coal Displaced by NGCC		21,637	16%		
Remaining Coal		100,140	76%	55%	100%
Total Natural Gas CC Potential		29,029	22%	80%	100%



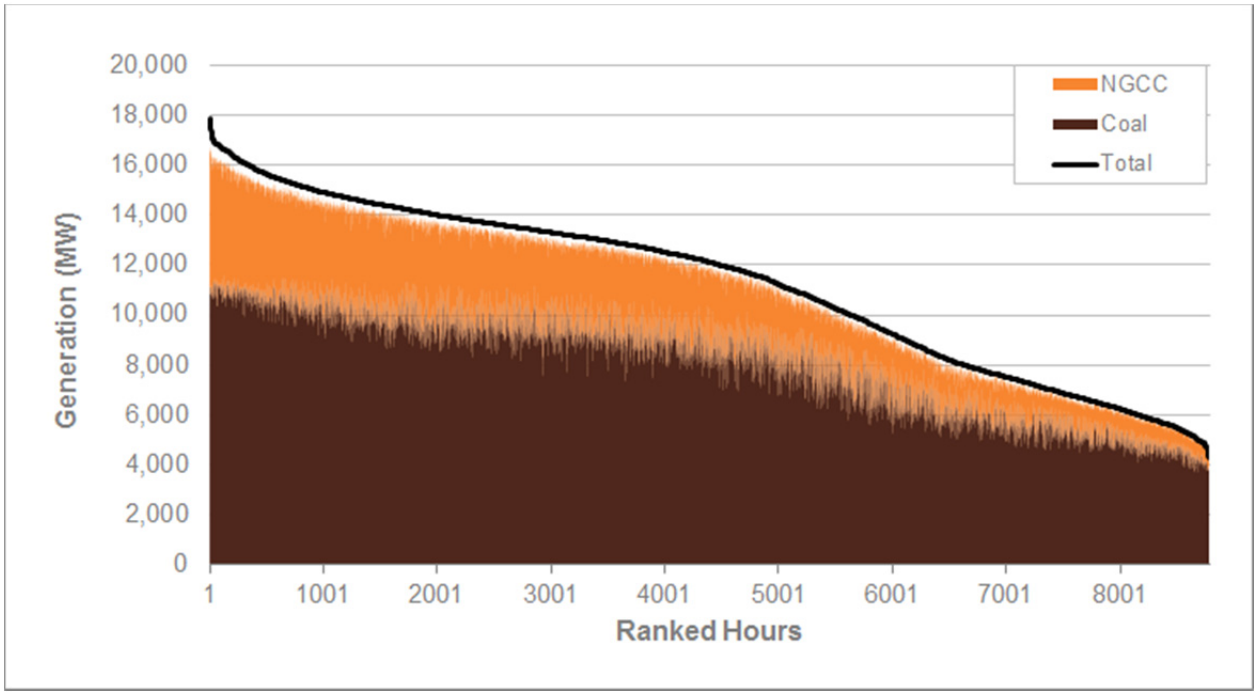


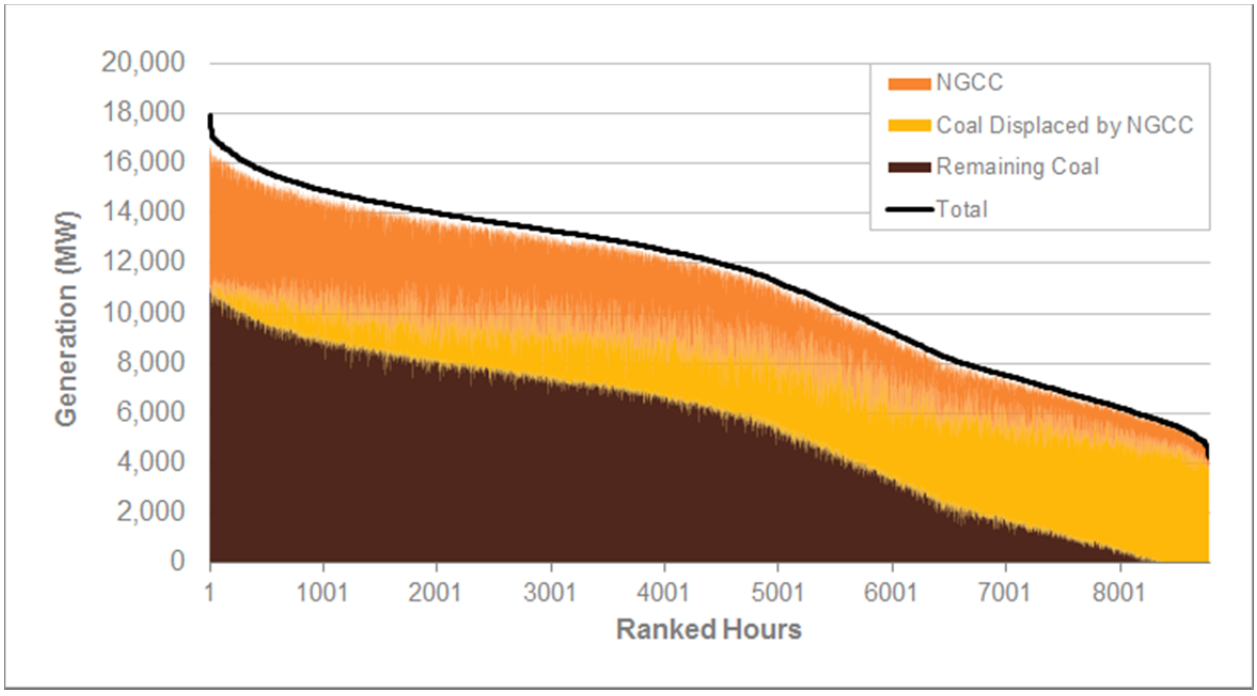
NEWE: New England	Peak Load (MW)	Generation (GWh)	% of Total Generation	Capacity Factor	% of Total Days
Total Fossil (2012)	16,045	54,698			
Coal (2012)	2,361	3,974	7%	17%	82%
Natural Gas CC (2012)	9,046	47,425	87%	50%	100%
Coal Displaced by NGCC		3,331	6%		
Remaining Coal		643	1%	3%	9%
Total Natural Gas CC Potential		50,755	93%	54%	100%



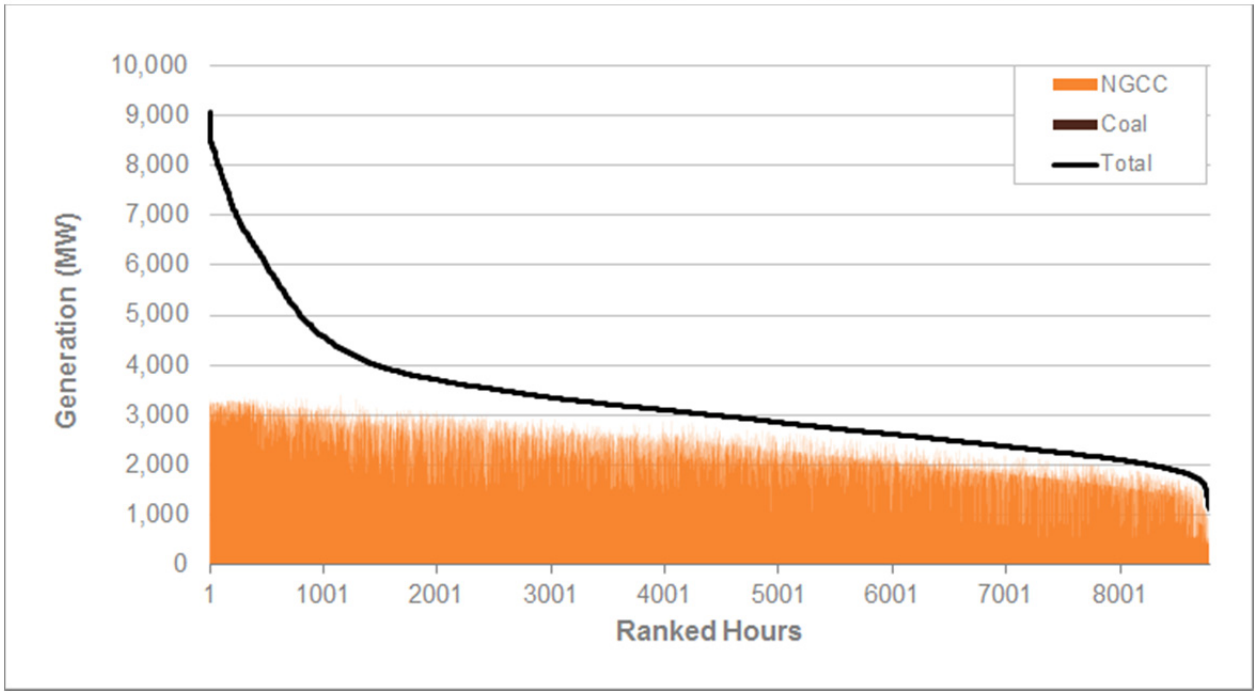


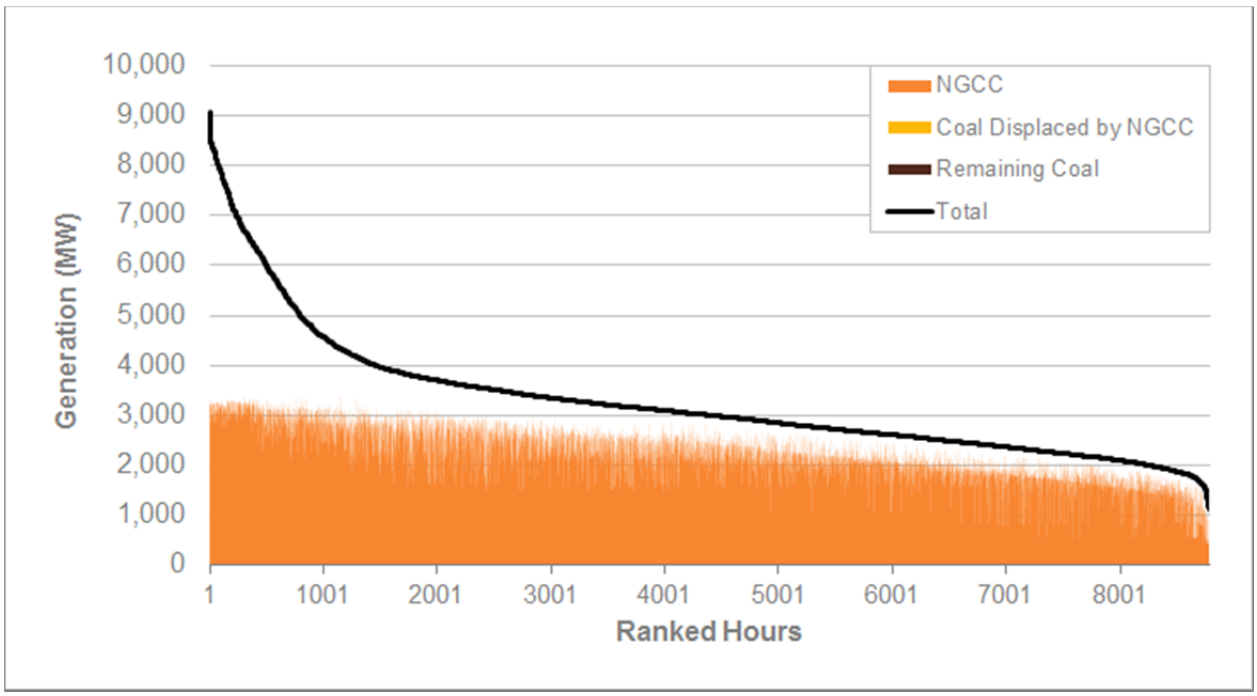
NWPP: Northwest	Peak Load (MW)	Generation (GWh)	% of Total Generation	Capacity Factor	% of Total Days
Total Fossil (2012)	17,889	98,513			
Coal (2012)	11,606	71,193	72%	66%	100%
Natural Gas CC (2012)	5,801	24,269	25%	40%	100%
Coal Displaced by NGCC		24,397	25%		
Remaining Coal		46,797	48%	43%	96%
Total Natural Gas CC Potential		48,666	49%	80%	100%



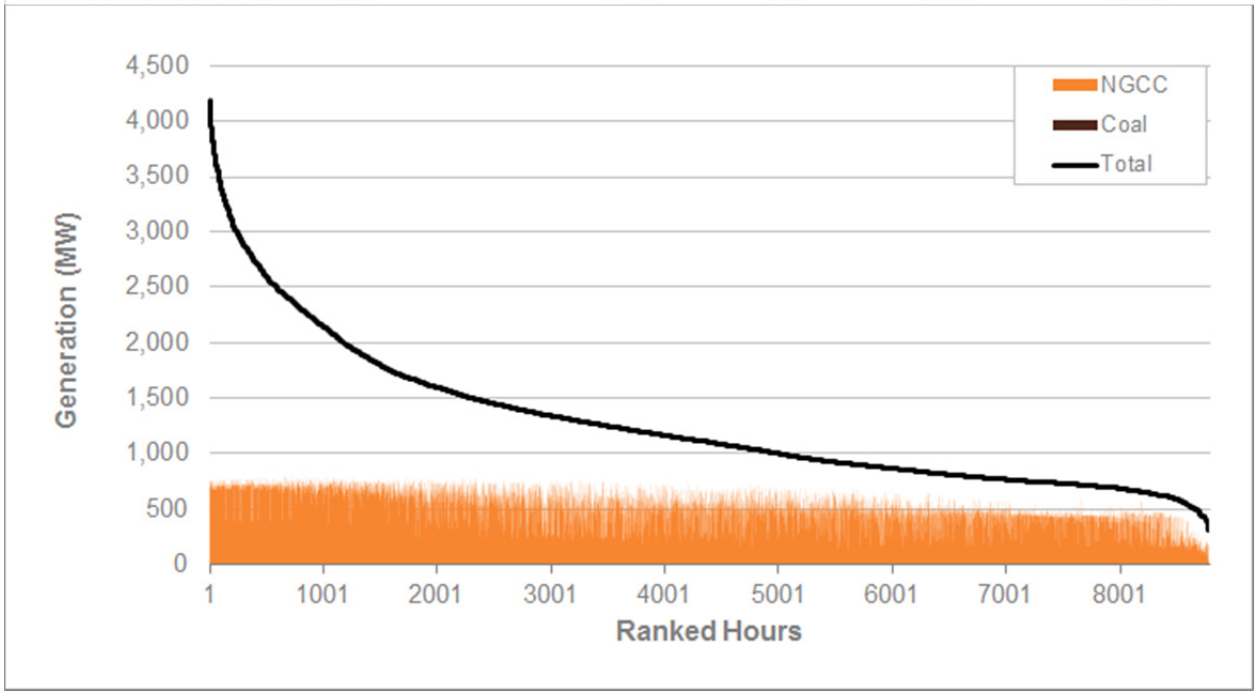


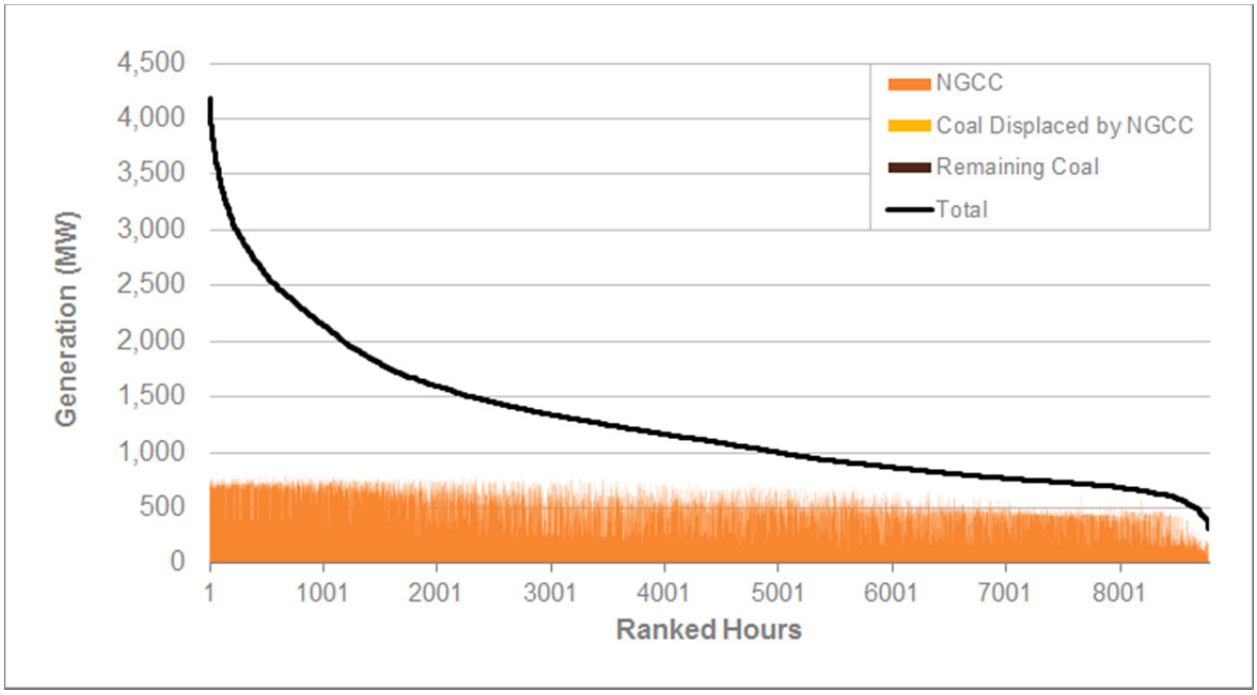
NYCW: NYC/Westchester	Peak Load (MW)	Generation (GWh)	% of Total Generation	Capacity Factor	% of Total Days
Total Fossil (2012)	9,059	28,829			
Coal (2012)	0	0	0%	0%	0%
Natural Gas CC (2012)	3,404	19,802	69%	55%	100%
Coal Displaced by NGCC		0	0%		
Remaining Coal		0	0%	0%	0%
Total Natural Gas CC Potential		19,802	69%	55%	100%



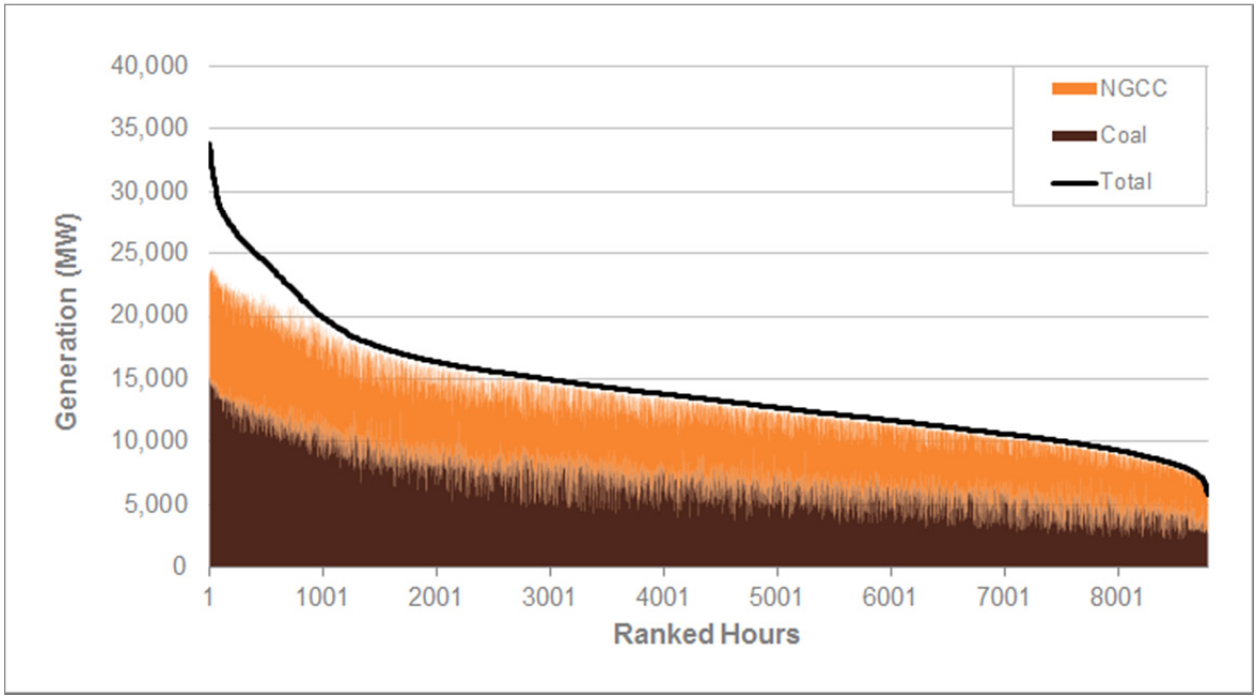


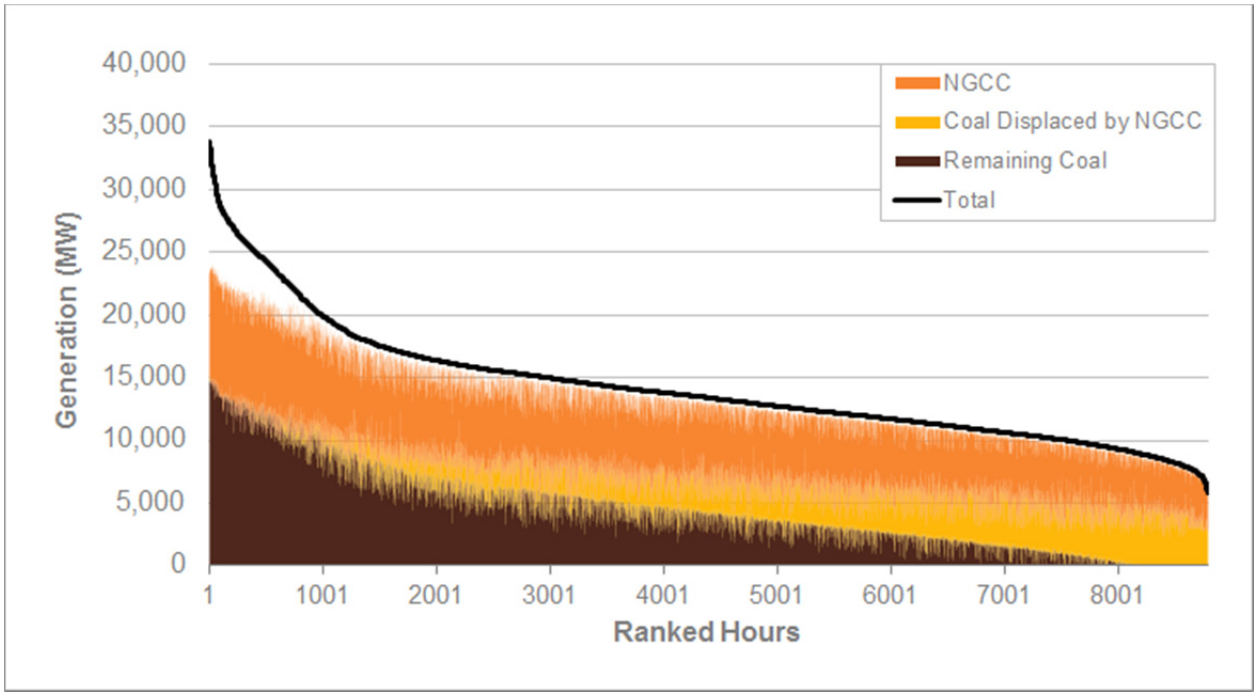
NYLI: Long Island	Peak Load (MW)	Generation (GWh)	% of Total Generation	Capacity Factor	% of Total Days
Total Fossil (2012)	4,186	11,264			
Coal (2012)	0	0	0%	0%	0%
Natural Gas CC (2012)	795	4,693	42%	59%	100%
Coal Displaced by NGCC		0	0%		
Remaining Coal		0	0%	0%	0%
Total Natural Gas CC Potential		4,693	42%	59%	100%



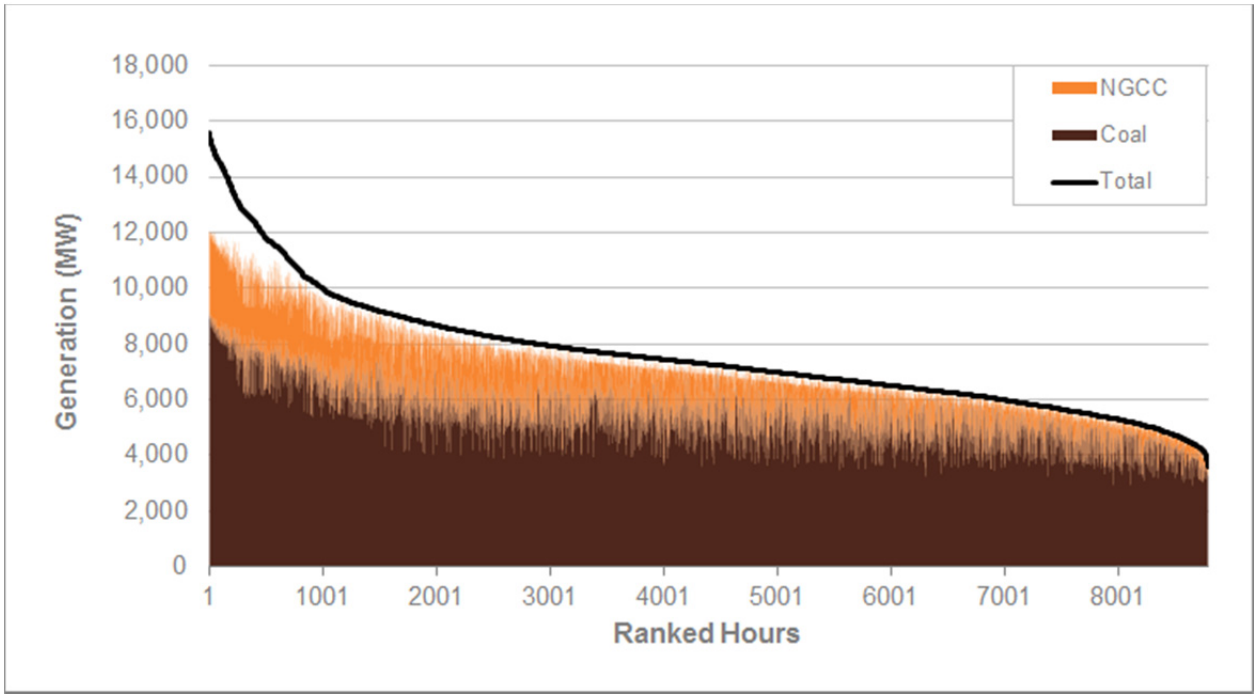


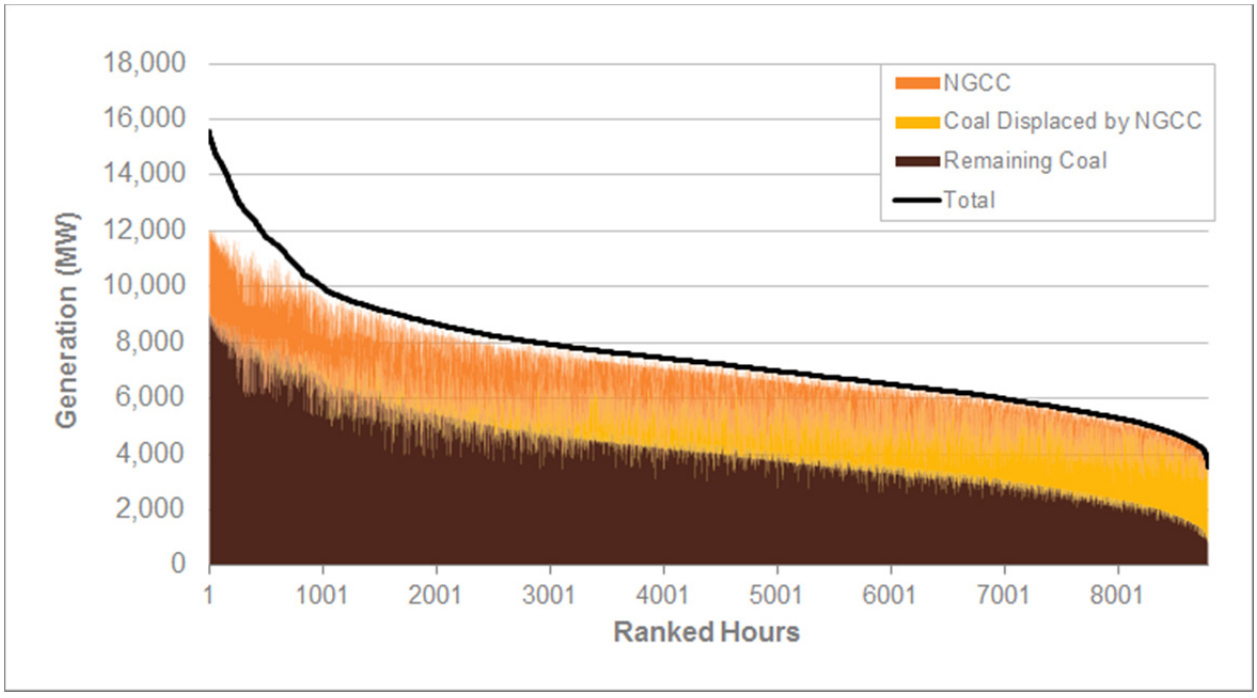
RFCE: RFC East	Peak Load (MW)	Generation (GWh)	% of Total Generation	Capacity Factor	% of Total Days
Total Fossil (2012)	33,821	125,303			
Coal (2012)	15,119	61,996	49%	42%	100%
Natural Gas CC (2012)	9,294	52,379	42%	55%	100%
Coal Displaced by NGCC		23,204	19%		
Remaining Coal		38,792	31%	27%	92%
Total Natural Gas CC Potential		75,583	60%	79%	100%



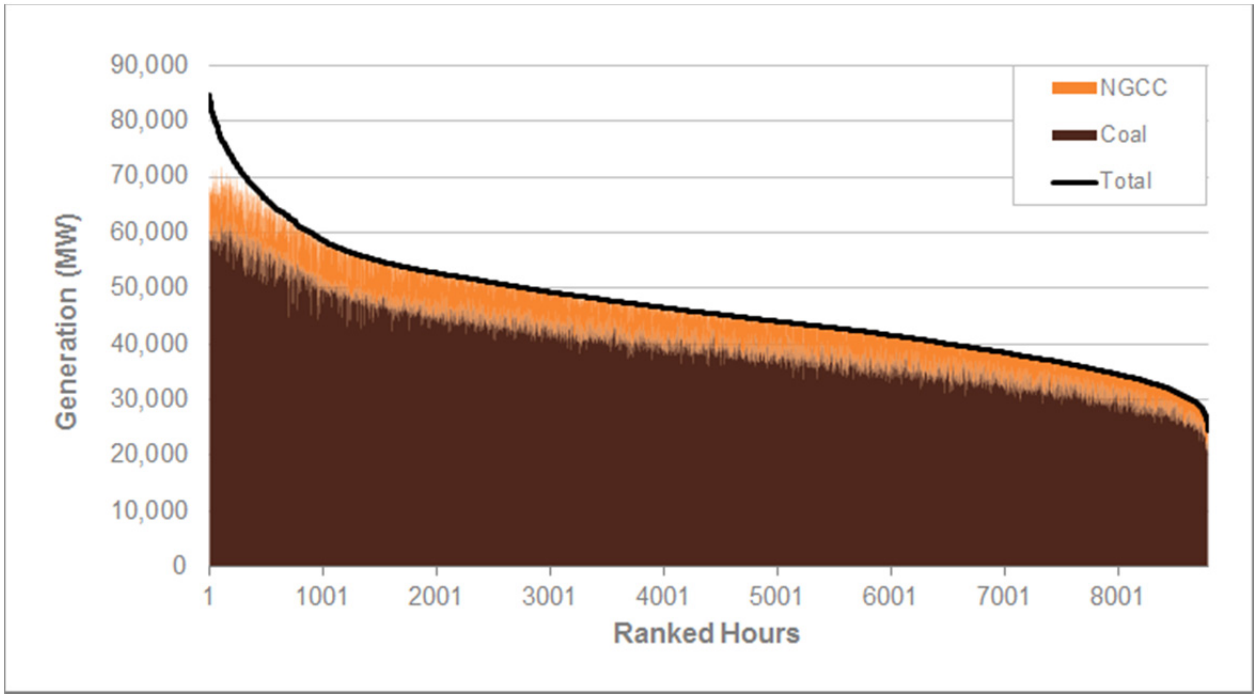


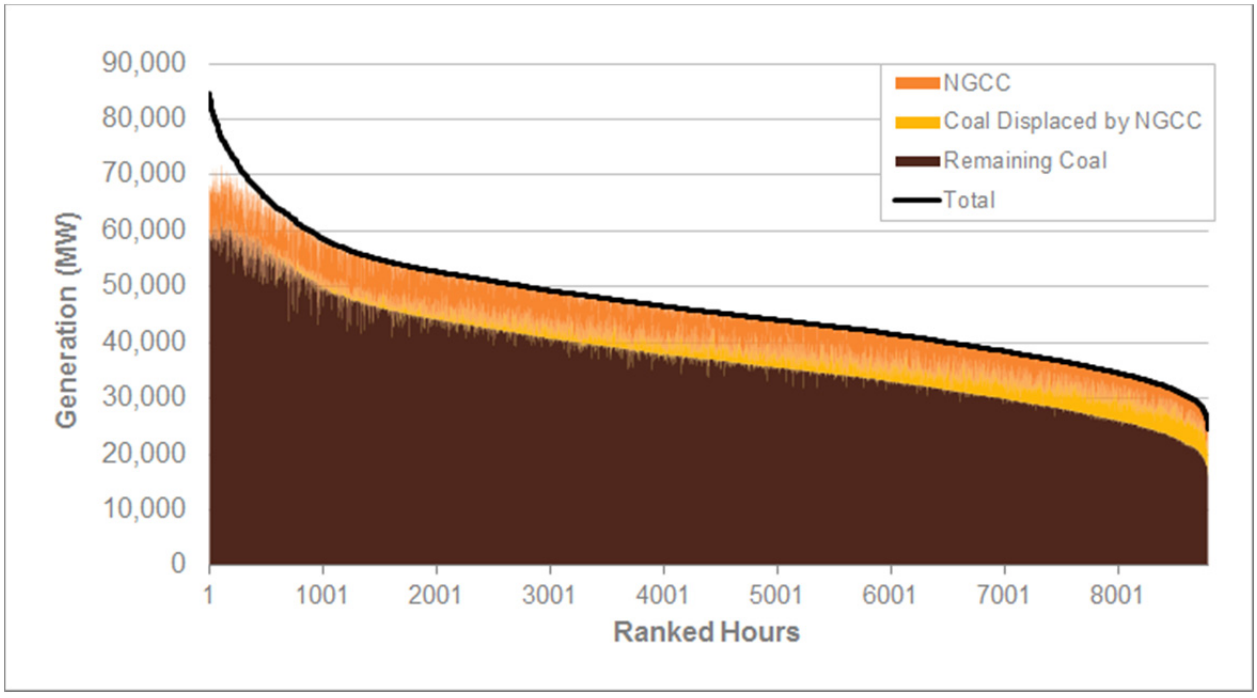
RFCM: RFC Michigan	Peak Load (MW)	Generation (GWh)	% of Total Generation	Capacity Factor	% of Total Days
Total Fossil (2012)	15,575	66,883			
Coal (2012)	9,184	48,569	73%	55%	100%
Natural Gas CC (2012)	3,271	13,857	21%	44%	100%
Coal Displaced by NGCC		11,444	17%		
Remaining Coal		37,124	56%	42%	100%
Total Natural Gas CC Potential		25,301	38%	80%	100%



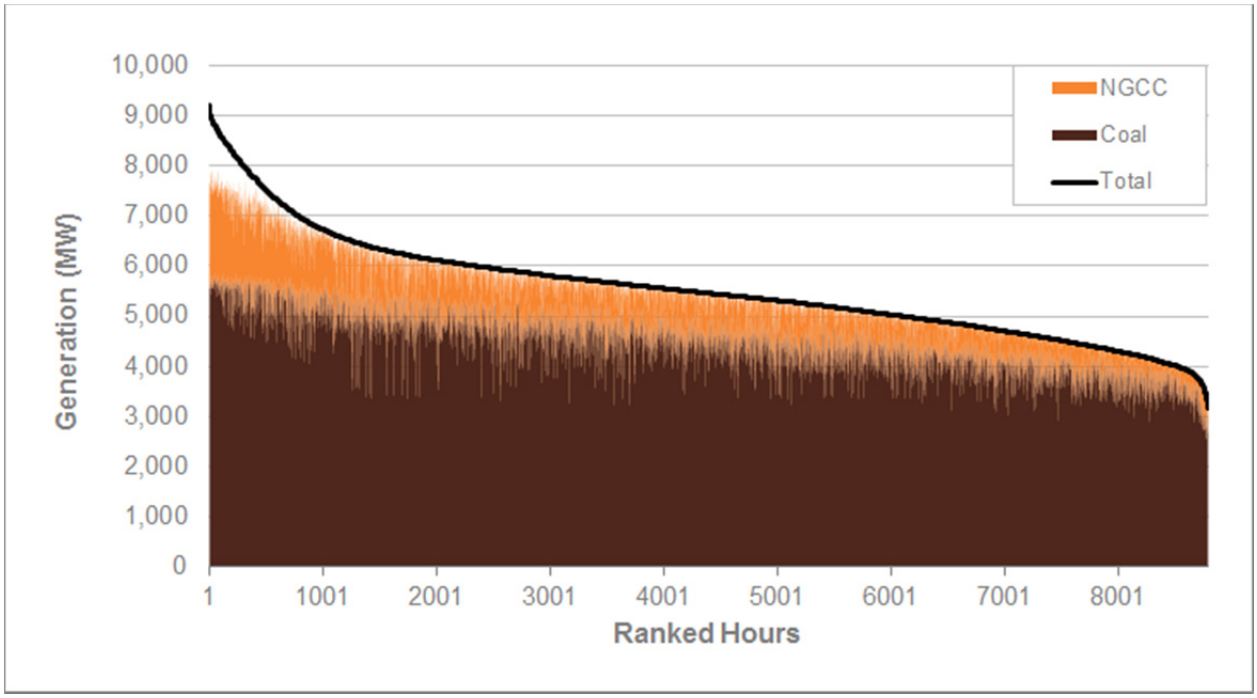


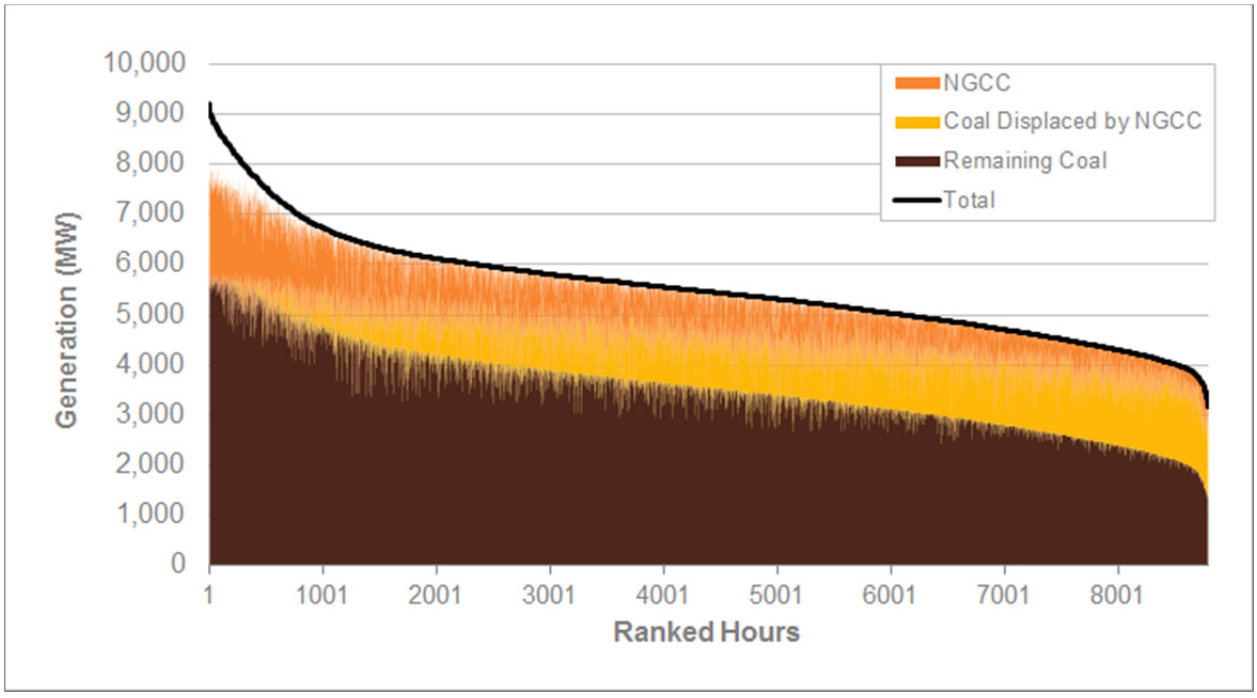
RFCW: RFC West	Peak Load (MW)	Generation (GWh)	% of Total Generation	Capacity Factor	% of Total Days
Total Fossil (2012)	84,679	410,984			
Coal (2012)	63,737	353,929	86%	50%	100%
Natural Gas CC (2012)	8,863	51,465	13%	56%	100%
Coal Displaced by NGCC		22,576	5%		
Remaining Coal		331,353	81%	47%	100%
Total Natural Gas CC Potential		74,041	18%	80%	100%



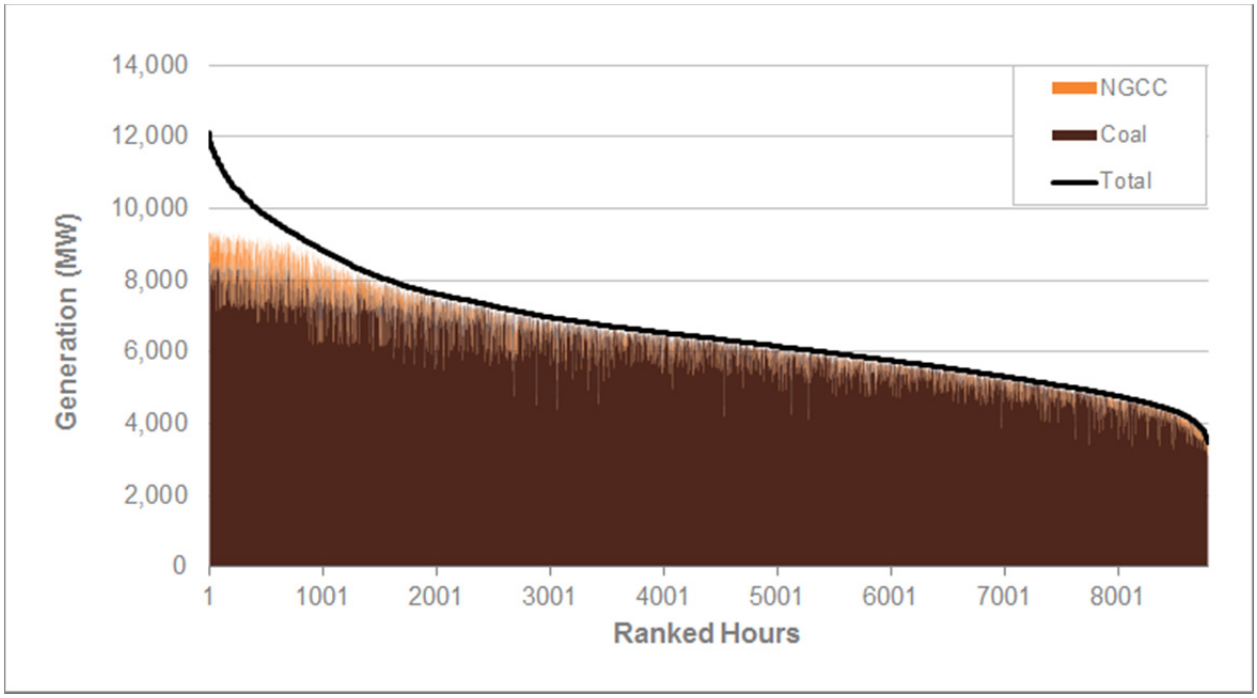


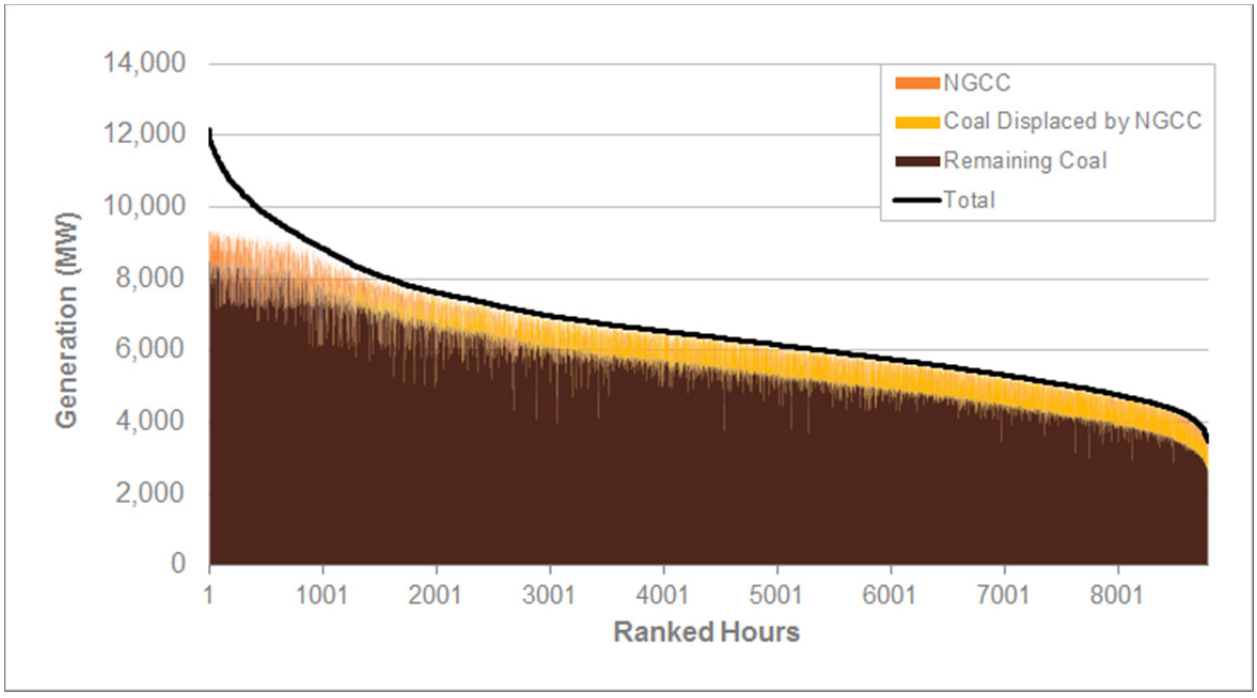
RMPA: Rockies	Peak Load (MW)	Generation (GWh)	% of Total Generation	Capacity Factor	% of Total Days
Total Fossil (2012)	9,210	48,756			
Coal (2012)	5,877	39,418	81%	72%	100%
Natural Gas CC (2012)	2,190	8,068	17%	39%	100%
Coal Displaced by NGCC		8,621	18%		
Remaining Coal		30,797	63%	56%	100%
Total Natural Gas CC Potential		16,689	34%	80%	100%



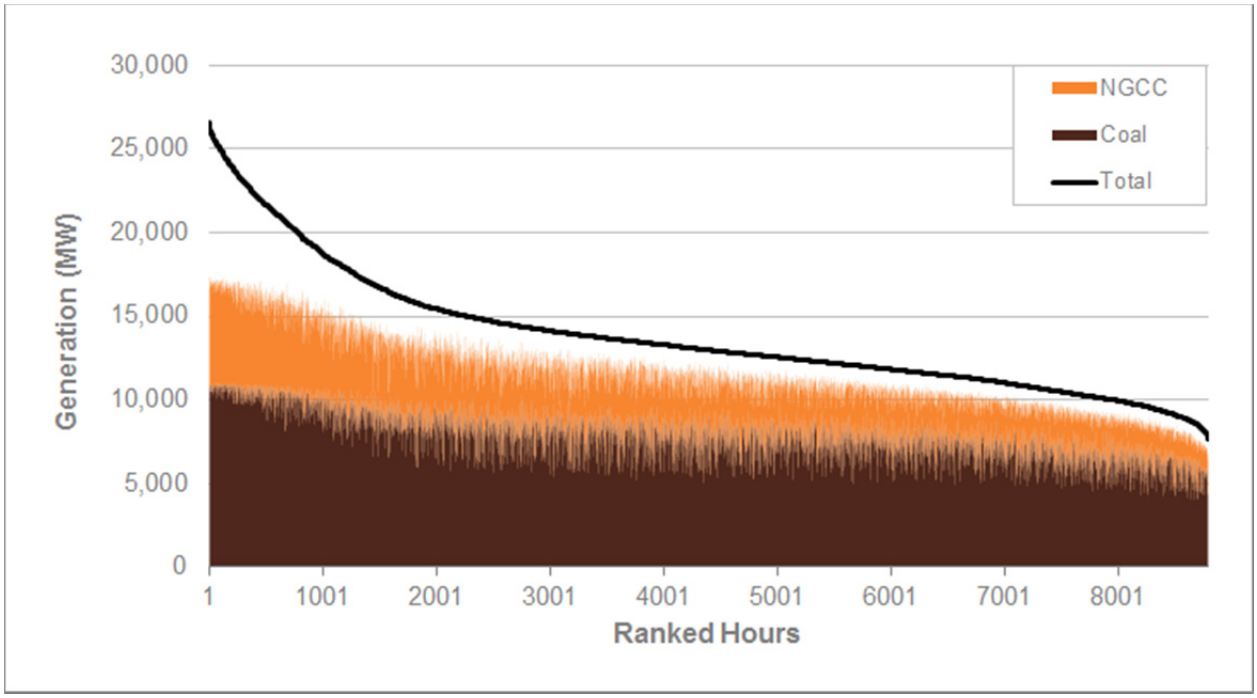


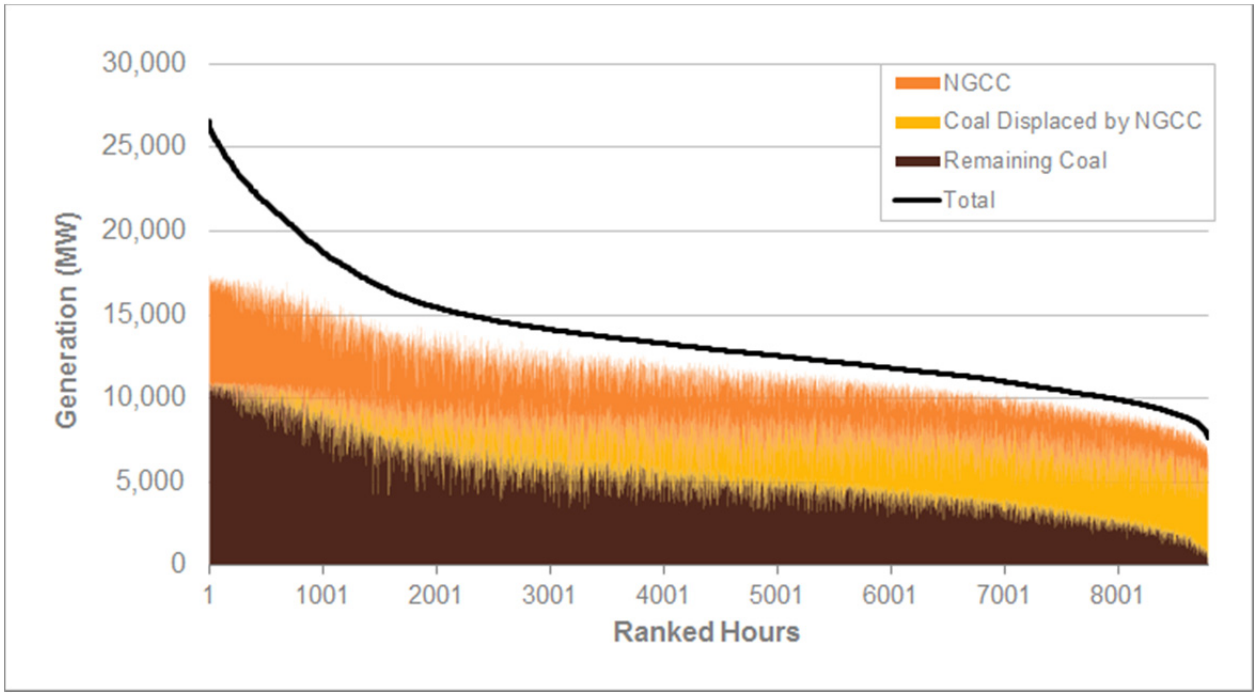
SPNO: SPP North	Peak Load (MW)	Generation (GWh)	% of Total Generation	Capacity Factor	% of Total Days
Total Fossil (2012)	12,140	58,434			
Coal (2012)	8,583	53,540	92%	66%	100%
Natural Gas CC (2012)	851	1,807	3%	23%	48%
Coal Displaced by NGCC		4,601	8%		
Remaining Coal		48,940	84%	60%	100%
Total Natural Gas CC Potential		6,407	11%	81%	100%



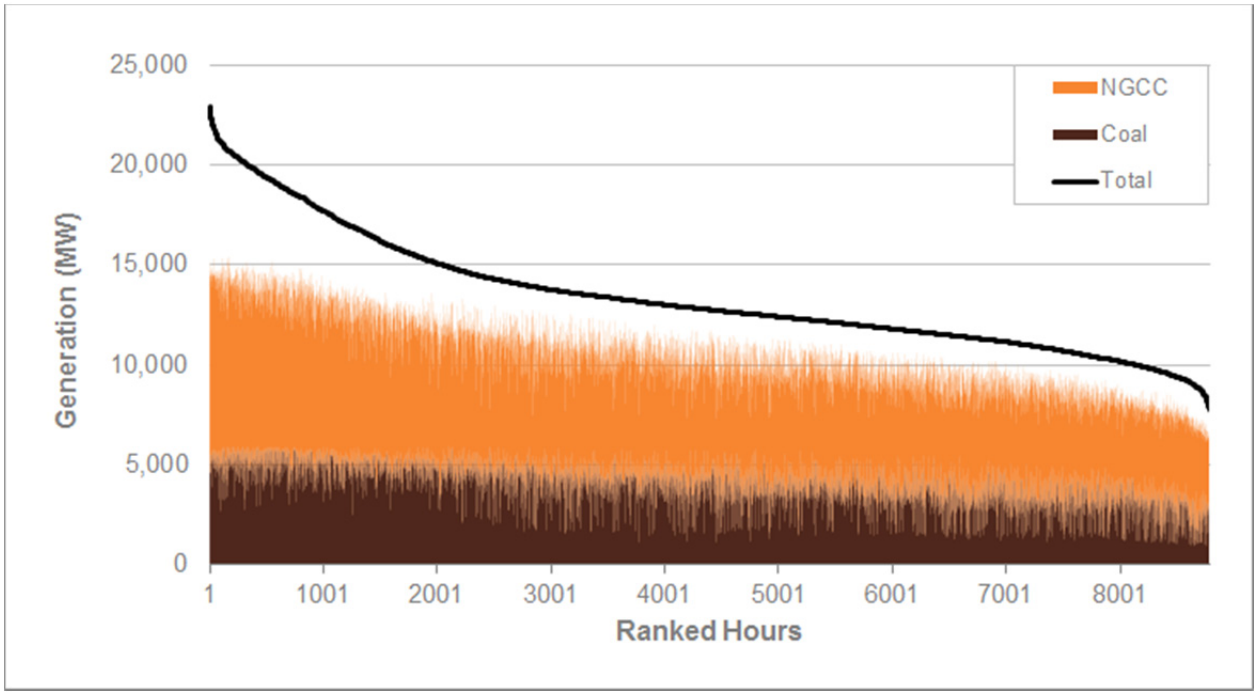


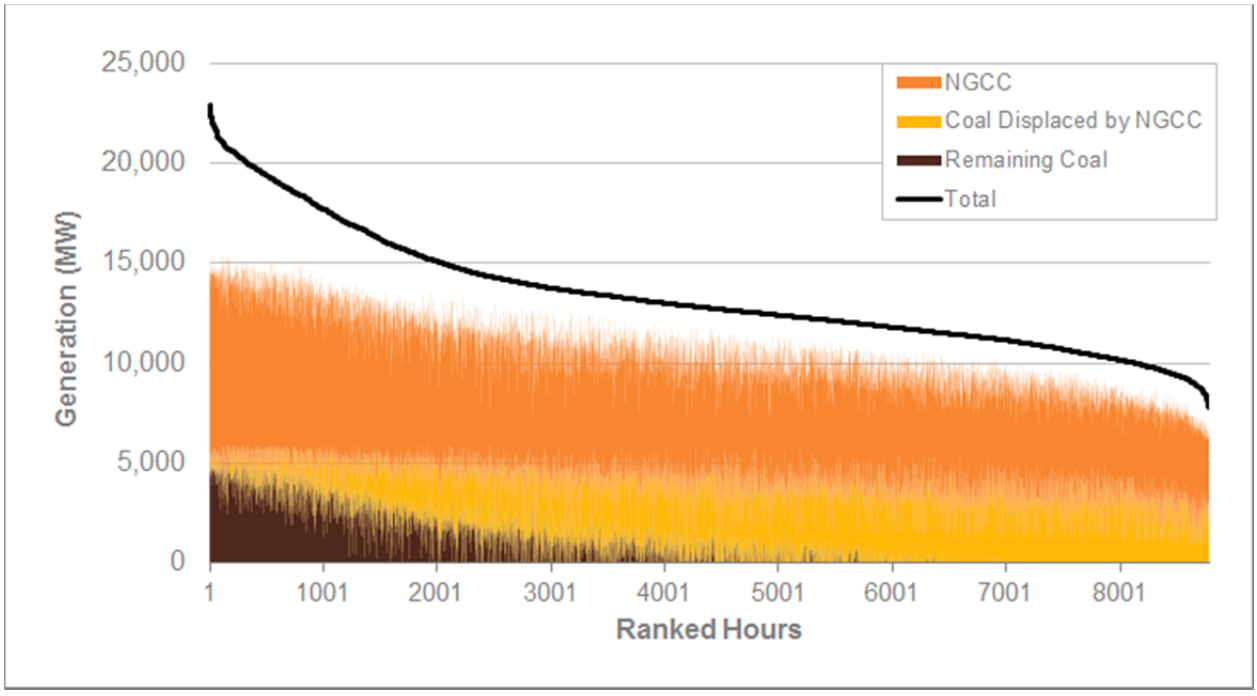
SPSO: SPP South	Peak Load (MW)	Generation (GWh)	% of Total Generation	Capacity Factor	% of Total Days
Total Fossil (2012)	26,554	121,281			
Coal (2012)	10,988	69,119	57%	68%	100%
Natural Gas CC (2012)	6,456	31,821	26%	47%	100%
Coal Displaced by NGCC		22,703	19%		
Remaining Coal		46,416	38%	45%	100%
Total Natural Gas CC Potential		54,524	45%	80%	100%



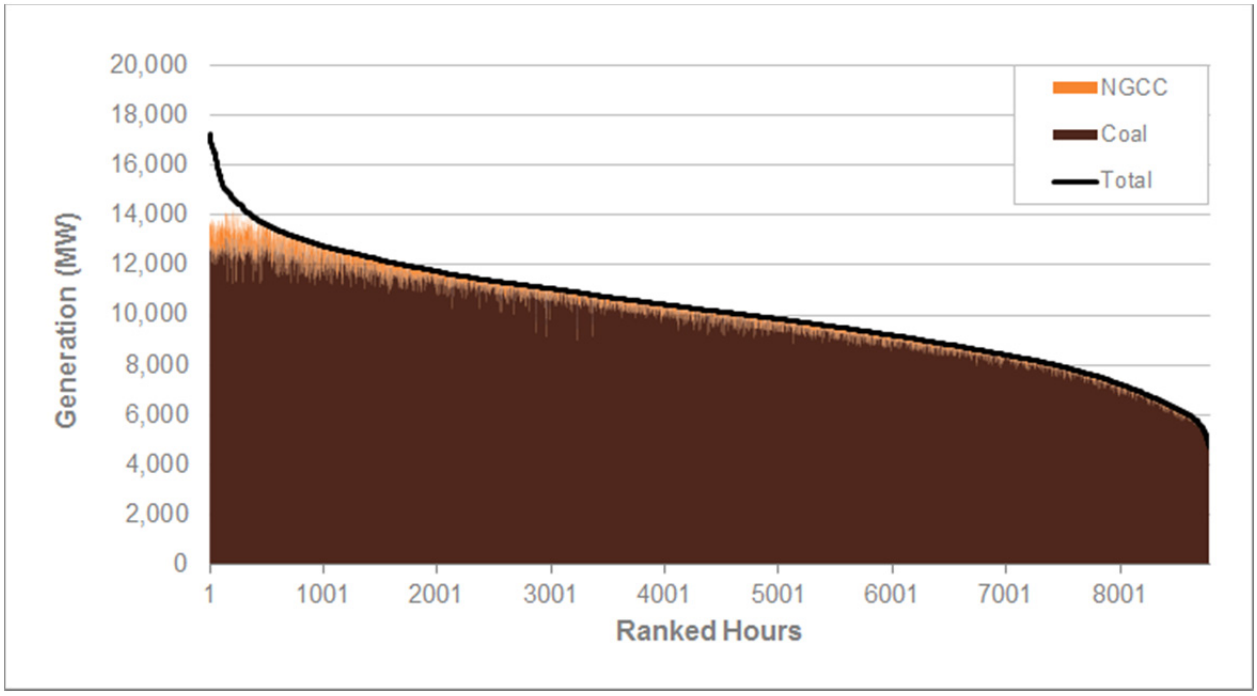


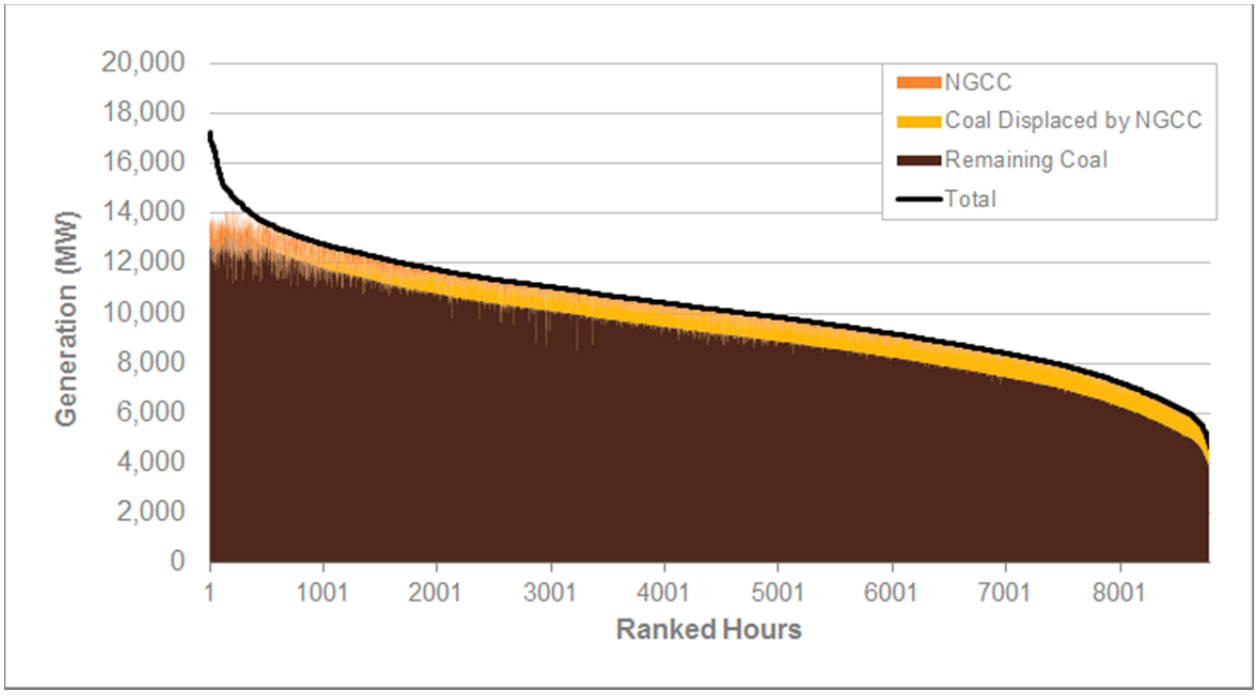
SRMV: SERC Mississippi Valley	Peak Load (MW)	Generation (GWh)	% of Total Generation	Capacity Factor	% of Total Days
Total Fossil (2012)	22,930	117,912			
Coal (2012)	5,939	35,059	30%	66%	100%
Natural Gas CC (2012)	10,258	56,397	48%	52%	100%
Coal Displaced by NGCC		25,288	21%		
Remaining Coal		9,771	8%	18%	57%
Total Natural Gas CC Potential		81,685	69%	76%	100%



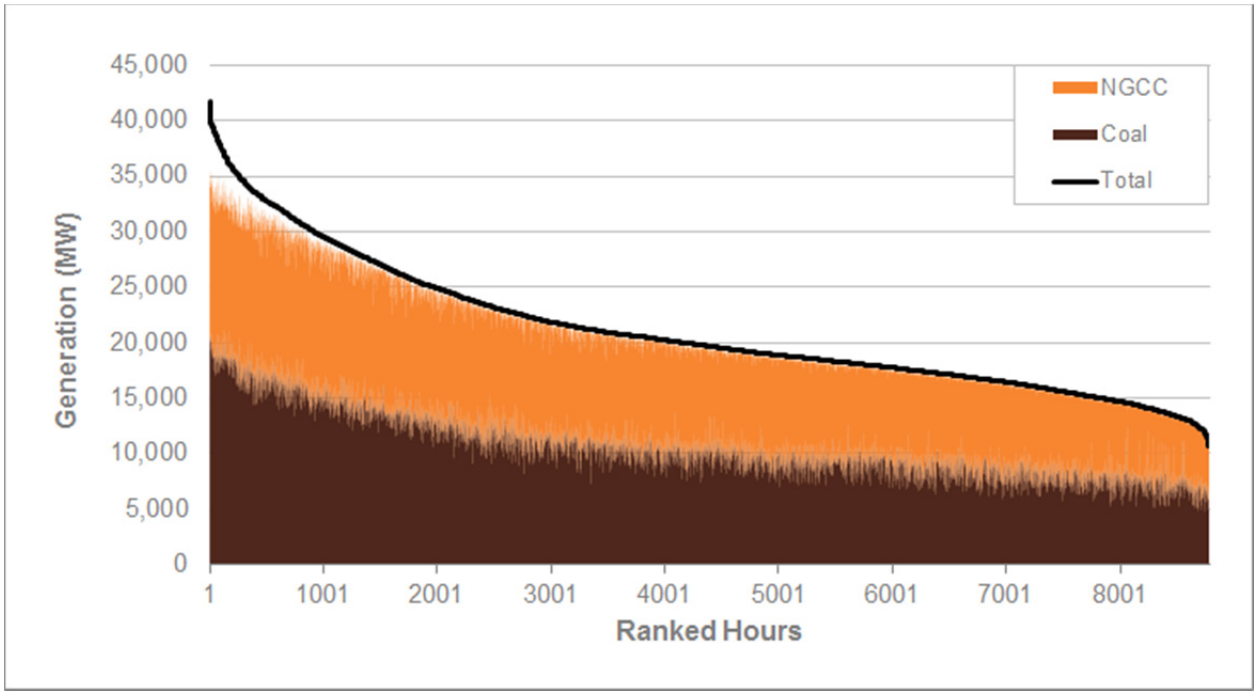


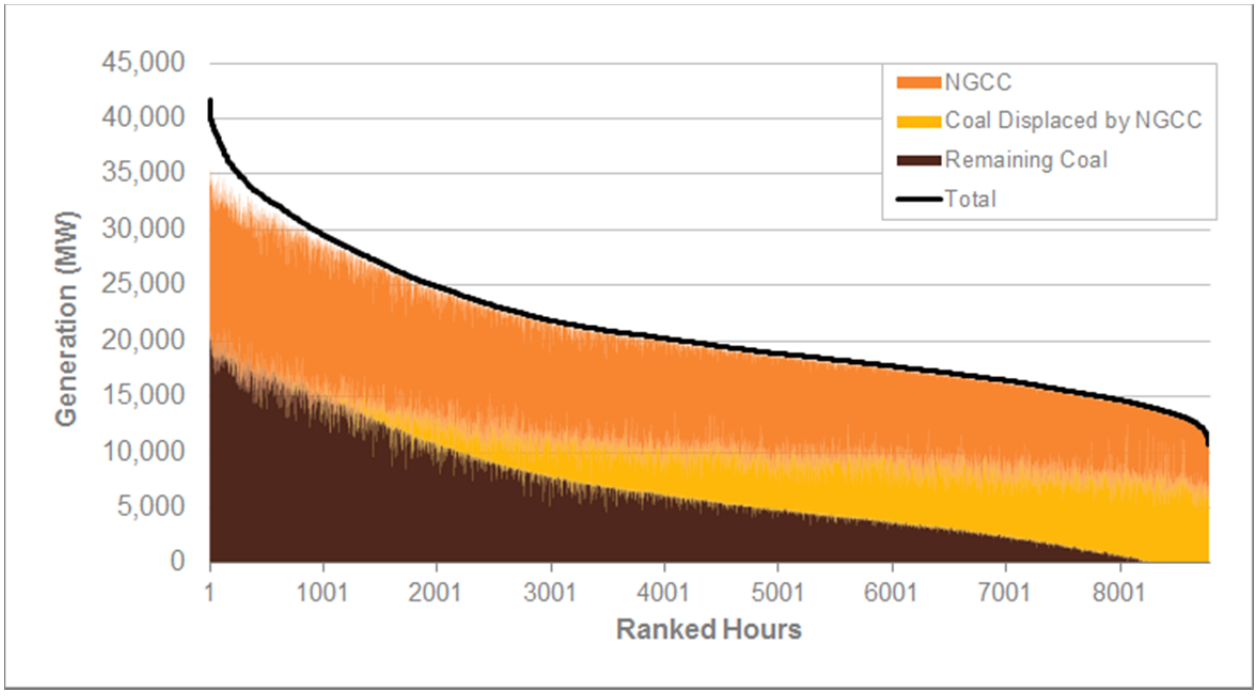
SRMW: SERC Midwest	Peak Load (MW)	Generation (GWh)	% of Total Generation	Capacity Factor	% of Total Days
Total Fossil (2012)	17,215	89,577			
Coal (2012)	13,566	86,283	96%	67%	100%
Natural Gas CC (2012)	1,141	2,413	3%	24%	66%
Coal Displaced by NGCC		5,812	6%		
Remaining Coal		80,471	90%	63%	100%
Total Natural Gas CC Potential		8,225	9%	80%	100%



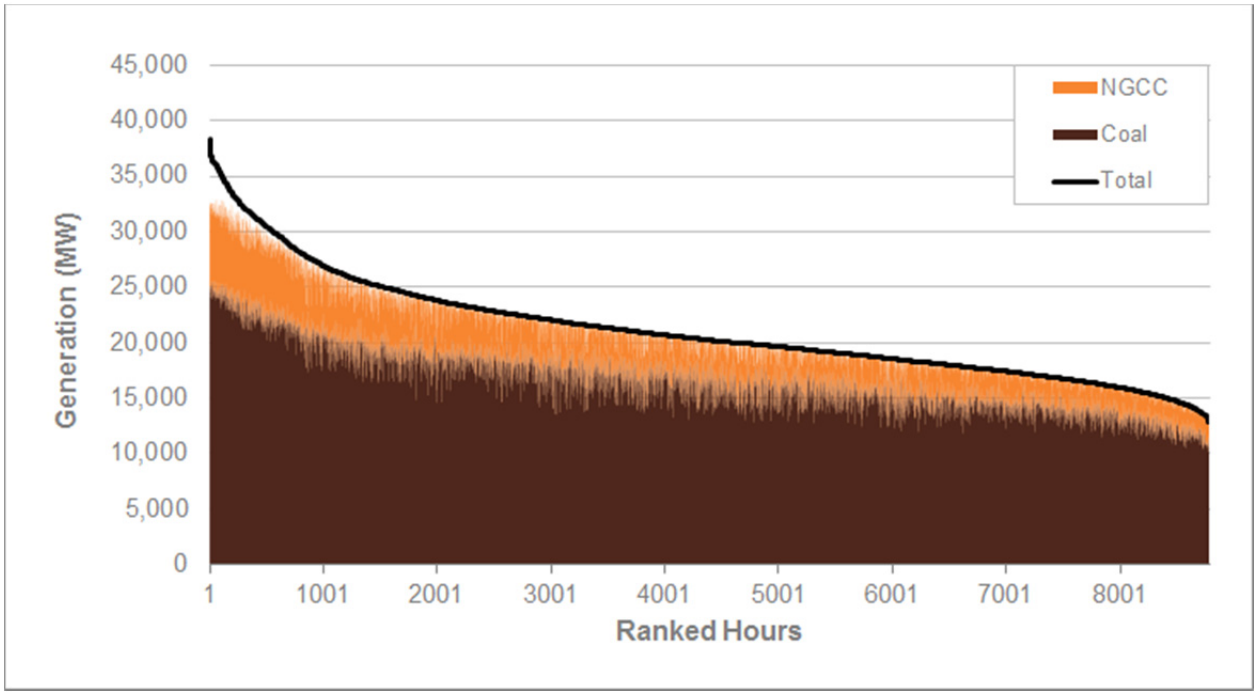


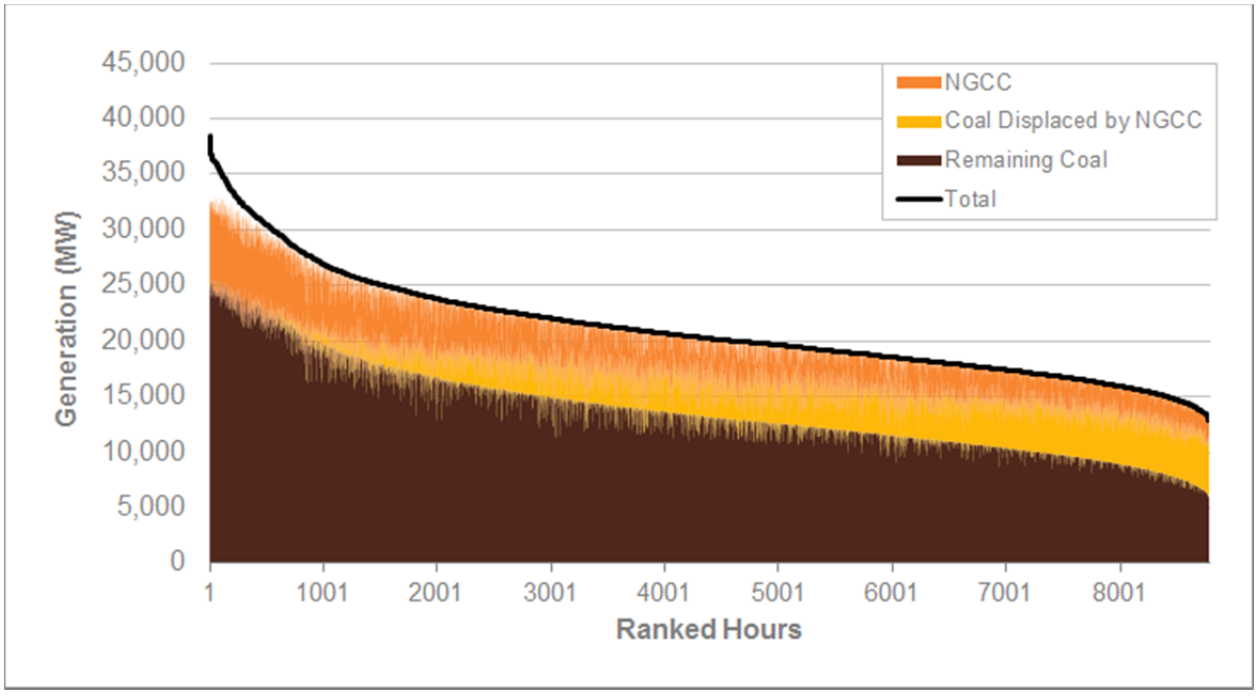
SRSO: SERC South	Peak Load (MW)	Generation (GWh)	% of Total Generation	Capacity Factor	% of Total Days
Total Fossil (2012)	41,656	185,846			
Coal (2012)	21,189	94,995	51%	42%	100%
Natural Gas CC (2012)	14,985	85,262	46%	56%	100%
Coal Displaced by NGCC		35,646	19%		
Remaining Coal		59,349	32%	26%	95%
Total Natural Gas CC Potential		120,908	65%	80%	100%



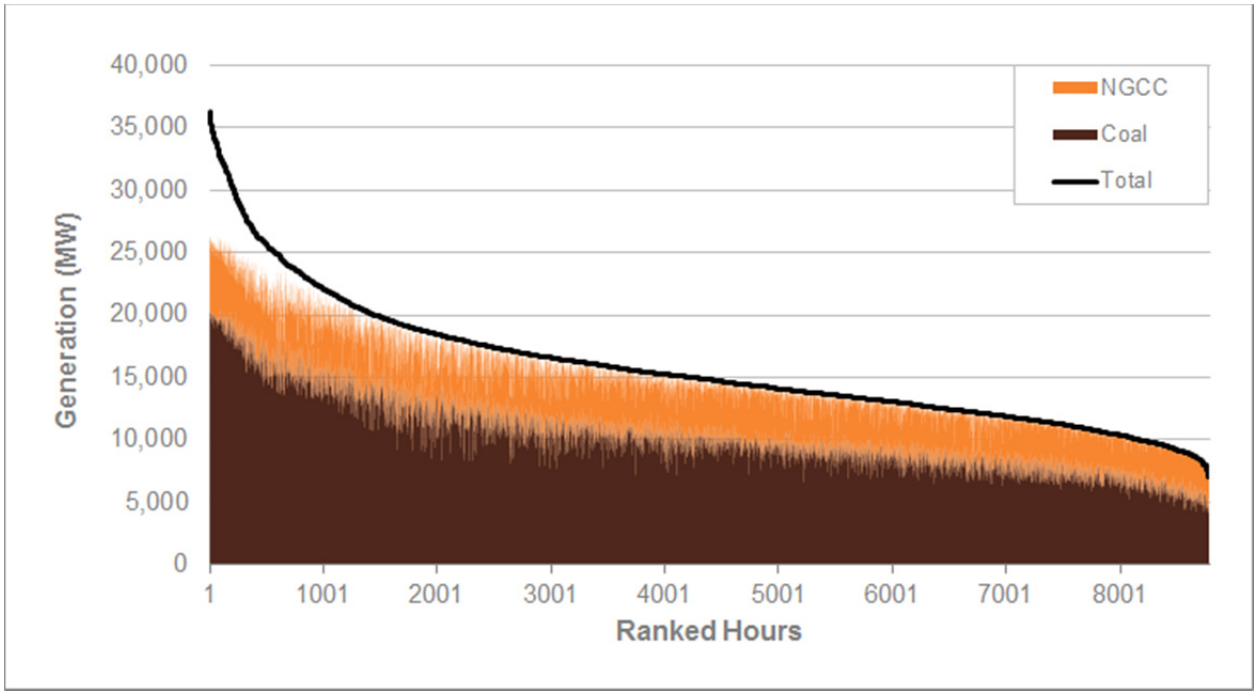


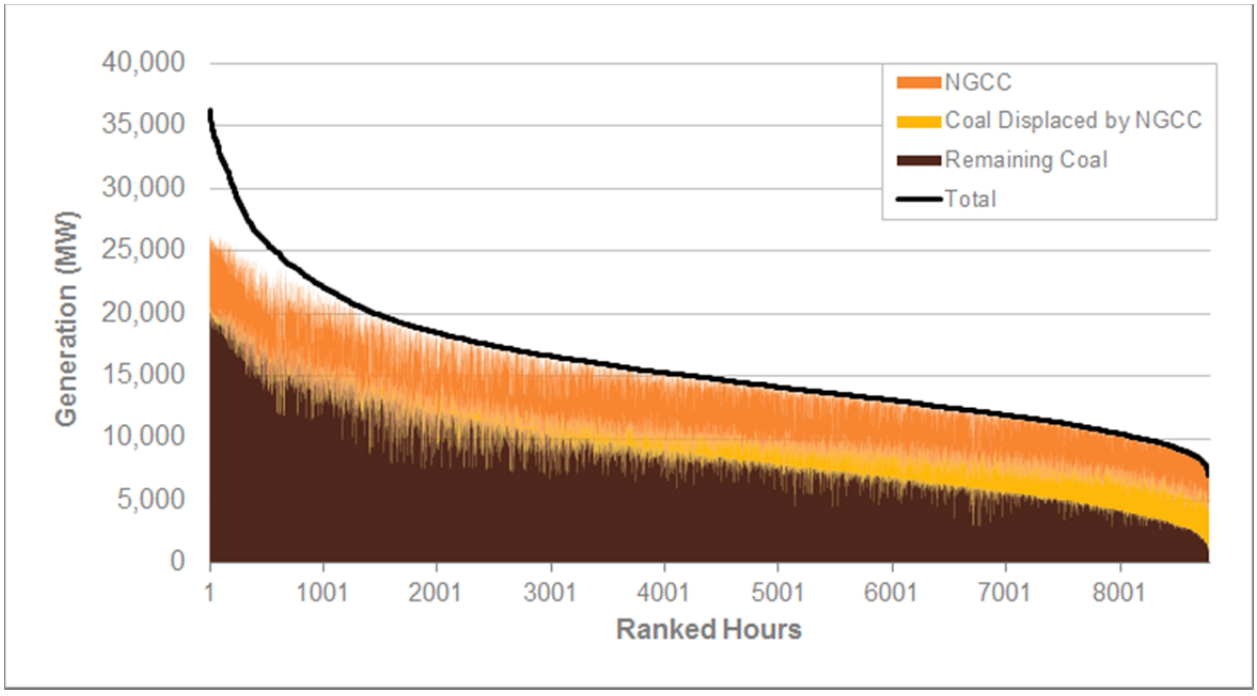
SRTV: SERC Tennessee Valley	Peak Load (MW)	Generation (GWh)	% of Total Generation	Capacity Factor	% of Total Days
Total Fossil (2012)	38,398	185,889			
Coal (2012)	25,595	147,051	79%	59%	100%
Natural Gas CC (2012)	7,672	34,337	18%	45%	100%
Coal Displaced by NGCC		26,871	14%		
Remaining Coal		120,180	65%	48%	100%
Total Natural Gas CC Potential		61,208	33%	80%	100%





SRVC: SERC Virginia/Carolina	Peak Load (MW)	Generation (GWh)	% of Total Generation	Capacity Factor	% of Total Days
Total Fossil (2012)	36,247	139,192			
Coal (2012)	20,561	91,648	66%	45%	100%
Natural Gas CC (2012)	6,192	38,004	27%	57%	100%
Coal Displaced by NGCC		14,905	11%		
Remaining Coal		76,743	55%	38%	100%
Total Natural Gas CC Potential		52,909	38%	80%	100%





5. FINDINGS

5.1. Caveats

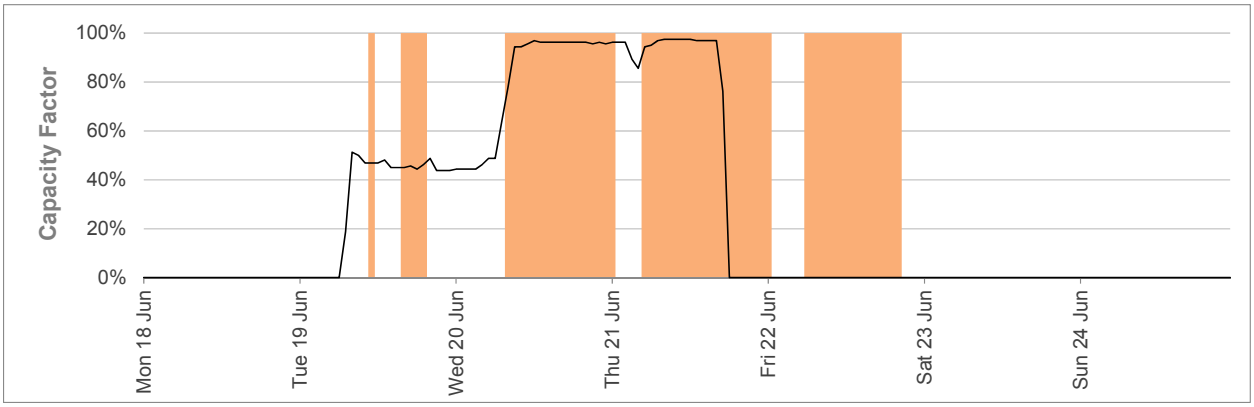
This analysis assumes that all coal generation is able to be displaced in any hour, regardless of any constraints. In reality, fossil generation units, particularly coal, have significant operational constraints, including ramp rates, minimum load levels, and minimum up-times/minimum down-times. A ramp rate is the speed at which a generator can add capacity. However, the range of capacities to which a coal unit can ramp is not continuous; instead, these units have discrete, "preferred" capacities at which they operate. The lowest of these capacities is called the unit's "minimum load level," which for coal generators ranges from 35-50 percent of the unit's total rated output.[7] Units typically have two to three load levels, with the highest load level being equal to the unit's full capacity. While many coal units are able to ramp from zero to full capacity within an hour, once these units reach full capacity, they must remain running for a period of time due to the thermodynamics associated with the boiler materials. [8] This "minimum up-time" varies by climate, season, and unit. At the same time, after a coal unit has ramped down, the amount of time until the unit can turn back on, and then reach full capacity, is limited by the materials used to construct the boiler.

For example, the black line in Figure 11 displays the operation of the Mount Tom coal plant over the week beginning Monday, June 18, 2012. The shaded bars mark hours in which fossil load for the New England region exceeded the 90th percentile of fossil load for the year. The day of Tuesday, June 19 marked the beginning of a high-load period. Because of technical constraints surrounding the operation of Mount Tom's boiler, the generator was activated and ramped to half its full capacity early in the morning of Tuesday, June 19, despite not being needed for peak load until the middle of the day. Similarly, because of ramping and "minimum up-time/down-time" constraints, the unit continued to run overnight between June 19 and June 20 so that it could meet the daytime load requirements of June 20, despite not being the most economically efficient generator overnight.

[7] Göransson, Lisa and Filip Johnsson. (2010). "Large Scale Integration of Wind Power in Thermal Power Systems." *Wind Power*. New York, NY: INTECH.

[8] "Summary Report on Coal Plant Dynamic Performance Capability." Renewable Northwest Project. 2010. Table 2. Available at http://rnp.org/sites/default/files/pdfs/RNP%20Coal%20Report%2010Aug16.pdf.

Figure 11. Operation of Mount Tom coal plant, June 18, 2012 through June 25, 2012. Mount Tom achieved an annual 2012 capacity factor of 6%.



Source: EPA Air Market Programs dataset 2012, EIA 860 2011

Additionally, there are other obstacles associated with increasing the output of individual gas-fired generators, including access to gas supply and pipeline capacity; environmental constraints; warranty conditions on the turbines; and other political, economic, or regulatory restrictions.

5.2. Results

Table 2 shows a summary of the changes in coal generation and natural gas CC generation by region. In some regions, the modeled shift in generation caused the percent of coal generation to drop to less than 10 percent of the total (CAMX, NEWE, NYUP), and caused the natural gas CC capacity factor to rise by as much as 15 percent. These regions are currently using a large amount of natural gas generation, and coal units that were once baseload units are now being used only in peaking capacity. It is possible that coal units could be phased out entirely in these regions, with generation replaced by natural gas CCs and peaking capacity replaced by natural gas CTs.

Other regions see coal generation drop below 50 percent and see natural gas CC capacity factors rising above 70 percent (AZNM, ERCT, FRCC, NWPP, RFCE, SPSO, SRMV, and SRSO). These regions are currently using natural gas CCs as intermediate units. The hypothetical shift in generation causes these units to shift to a baseload profile.

The remaining nine regions see smaller losses in coal generation, on the order of between 5-18 percent. At the same time, the average natural gas CC capacity factor rises to 80 percent or greater. This implies that these regions currently have limited natural gas capacity. Raising the capacity factor of natural gas CC units in these regions to high levels (with respect to current operation) will have only a limited impact on offsetting coal generation.

Table 2. Coal and natural gas CC generation as a percent of total and capacity factor, current and hypothetical.

eGRID Region	Coal as a percent of total		NGCC as a percent of total		Coal Capacity Factor		NGCC Capacity Factor	
	2012 Actual	*2012 with report assumptions*	*2012 Actual*	*2012 with report assumptions*	*2012 Actual*	*2012 with report assumptions*	*2012 Actual*	*2012 with report assumptions*
AZNM	55%	21%	35%	69%	71%	27%	54%	79%
CAMX	11%	2%	66%	75%	63%	10%	54%	61%
ERCT	45%	19%	47%	73%	65%	28%	54%	78%
FRCC	27%	9%	58%	76%	53%	17%	54%	73%
MROE	91%	75%	6%	22%	57%	47%	54%	81%
MROW	92%	76%	6%	22%	67%	55%	54%	80%
NEWE	7%	1%	87%	93%	17%	3%	54%	54%
NWPP	72%	48%	25%	49%	66%	43%	54%	80%
NYCW	0%	0%	69%	69%	n/a	n/a	54%	55%
NYLI	0%	0%	42%	42%	n/a	n/a	59%	59%
NYUP	18%	3%	77%	92%	21%	4%	45%	54%
RFCE	49%	31%	42%	60%	42%	27%	55%	79%
RFCM	73%	56%	21%	38%	55%	42%	44%	80%
RFCW	86%	81%	13%	18%	50%	47%	56%	80%
RMPA	81%	63%	17%	34%	72%	56%	39%	80%
SPNO	92%	84%	3%	11%	66%	60%	23%	81%
SPSO	57%	38%	26%	45%	68%	45%	47%	80%
SRMV	30%	8%	48%	69%	66%	18%	52%	76%
SRMW	96%	90%	3%	9%	67%	63%	24%	80%
SRSO	51%	32%	46%	65%	42%	26%	56%	80%
SRTV	79%	65%	18%	33%	59%	48%	45%	80%
SRVC	66%	55%	27%	38%	45%	38%	57%	80%

6. NEXT STEPS

In this analysis, Synapse evaluated the available, unused natural gas generation that could feasibly be used to displace coal generation on a region-by-region basis. We recommend to stakeholders that the next phase in the study of the impact of displacing coal with natural gas include a heat rate analysis and the use of a dispatch model to determine the cost of the inflexibility of coal.

6.1. Heat Rate Analysis

Synapse conducted a preliminary analysis of the effect of heat rates on natural gas CC capacity factors. While this preliminary analysis was inconclusive, it is possible that correlation between these two variables could be accounted for after controlling for other variables such as age, locational constraints (e.g., transmission and load pockets), and cooling systems. Having a better understanding of the relationship between heat rate and capacity factor may allow stakeholders to better understand the actual maximum achievable capacity factor of specific natural gas CC units and their ability to displace local coal generation.

6.2. Inflexibility of Coal

Typical constraints for coal plants include minimum up-times, minimum down-times, and minimum load levels. Additionally, ramp times are generally considered as a constraint in dispatch models. The modeling and analysis preformed in this study reiterates that the inflexibility of coal is likely costing ratepayers, though the actual cost is currently undetermined. It would be possible to uncover the cost of coal's inflexibility by running a dispatch model (such as Strategist) with and without the typical constraints on coal. Modeling dispatch in this way could reveal additional detail regarding the actual cost of this inflexibility.

APPENDIX A: REGIONAL REPLACEMENT TABLE – ISOS/RTOS

ISO/RTO	Natural Gas Combined Cycle						Coal
	Num. of Units	Capacity (GW)	Generation in 2012 (TWh)	Average Capacity Factor	Potential Generation (TWh)	Incremental Potential (TWh)	Generation in 2012 (TWh)
CAISO	48	11	53	55%	78	25	0
ERCOT	123	29	115	45%	203	88	65
ISONE	56	11	51	54%	76	25	4
MISO	54	12	37	36%	83	45	289
NYISO	61	10	43	51%	69	25	4
PJM	120	24	118	55%	171	53	267
SPP	46	12	43	42%	82	40	148

Source: EPA Air Market Programs dataset 2012, EIA 860 2011

APPENDIX B: LIST OF NATURAL GAS COMBINED CYCLE UNITS

Year	State	Facility Name	Facility ID (ORISPL)	Unit ID	eGRID Sub-region	ISO / RTO	Capacity (MW)	Heat Rate (MMBtu/ MWh)	Generation (GWh)	Capacity Factor
2012	AL	Barry	3	6A	SRSO	none	287	7.00	2,023	80%
2012	AL	Barry	3	6B	SRSO	none	310	6.63	2,163	79%
2012	AL	Barry	3	7A	SRSO	none	293	6.63	2,216	86%
2012	AL	Barry	3	7B	SRSO	none	294	7.23	1,987	77%
2012	AL	E B Harris Generating Plant	7897	1A	SRSO	none	347	6.60	1,751	57%
2012	AL	E B Harris Generating Plant	7897	1B	SRSO	none	355	6.78	1,808	58%
2012	AL	E B Harris Generating Plant	7897	2A	SRSO	none	353	6.62	1,556	50%
2012	AL	E B Harris Generating Plant	7897	2B	SRSO	none	360	6.63	1,548	49%
2012	AL	Hillabee Energy Center	55411	CT1	SRSO	none	266	10.93	1,631	70%
2012	AL	Hillabee Energy Center	55411	CT2	SRSO	none	266	10.86	1,649	71%
2012	AL	Hog Bayou Energy Center	55241	COG01	SRSO	none	257	7.27	1,144	51%
2012	AL	International Paper-Riverdale Mill	54096	X026	SRSO	none	38	14.13	102	30%
2012	AL	McWilliams	533	**4	SRSO	none	121	12.30	213	20%
2012	AL	McWilliams	533	**V1	SRSO	none	194	11.15	1,026	60%

Year	State	Facility Name	Facility ID (ORISPL)	Unit ID	eGRID Sub-region	ISO / RTO	Capacity (MW)	Heat Rate (MMBtu/ MWh)	Generation (GWh)	Capacity Factor
2012	AL	McWilliams	533	**V2	SRSO	none	192	11.34	906	54%
2012	AL	MeadWestvaco Coated Board, LLC	54802	X022	SRSO	none	35	14.94	73	24%
2012	AL	Plant H. Allen Franklin	7710	1A	SRSO	none	312	6.73	1,643	60%
2012	AL	Plant H. Allen Franklin	7710	1B	SRSO	none	311	6.71	1,650	60%
2012	AL	Plant H. Allen Franklin	7710	2A	SRSO	none	347	6.71	1,921	63%
2012	AL	Plant H. Allen Franklin	7710	2B	SRSO	none	342	6.66	2,029	68%
2012	AL	Plant H. Allen Franklin	7710	3A	SRSO	none	342	7.09	1,933	64%
2012	AL	Plant H. Allen Franklin	7710	3B	SRSO	none	341	6.95	1,961	65%
2012	AL	SABIC Innovative Plastics - Burkville	7698	CC1	SRSO	none	164	6.86	912	63%
2012	AL	Tenaska Central Alabama Gen Station	55440	CTGDB1	SRSO	none	313	7.61	2,094	76%
2012	AL	Tenaska Central Alabama Gen Station	55440	CTGDB2	SRSO	none	321	7.40	2,066	73%
2012	AL	Tenaska Lindsay Hill Generating Station	55271	CT1	SRSO	none	302	6.84	982	37%
2012	AL	Tenaska Lindsay Hill Generating Station	55271	CT2	SRSO	none	301	6.92	1,048	40%
2012	AL	Tenaska Lindsay Hill Generating Station	55271	CT3	SRSO	none	312	6.78	976	36%
2012	AL	Theodore Cogeneration	7721	CC1	SRSO	none	296	6.83	1,894	73%

Year	State	Facility Name	Facility ID (ORISPL)	Unit ID	eGRID Sub-region	ISO / RTO	Capacity (MW)	Heat Rate (MMBtu/ MWh)	Generation (GWh)	Capacity Factor
2012	AL	Washington County Cogen (Olin)	7697	CC1	SRSO	none	239	6.85	1,227	58%
2012	AL	Decatur Energy Center	55292	CTG-1	SRTV	none	288	7.09	1,129	45%
2012	AL	Decatur Energy Center	55292	CTG-2	SRTV	none	298	7.13	1,040	40%
2012	AL	Decatur Energy Center	55292	CTG-3	SRTV	none	284	7.10	1,120	45%
2012	AL	International Paper-Courtland Mill	50245	GTX017	SRTV	none	37	14.83	74	23%
2012	AL	Morgan Energy Center	55293	CT-1	SRTV	none	296	7.18	1,356	52%
2012	AL	Morgan Energy Center	55293	CT-2	SRTV	none	291	7.23	1,380	54%
2012	AL	Morgan Energy Center	55293	CT-3	SRTV	none	294	7.22	1,463	57%
2012	AR	Dell Power Plant	55340	1	SRMV	none	413	7.45	390	11%
2012	AR	Dell Power Plant	55340	2	SRMV	none	419	7.35	331	9%
2012	AR	Hot Spring Energy Facility	55418	CT-1	SRMV	none	334	7.08	274	9%
2012	AR	Hot Spring Energy Facility	55418	CT-2	SRMV	none	340	7.08	263	9%
2012	AR	Magnet Cove Generating Station	55714	SN-01	SRMV	none	443	6.55	1,420	36%
2012	AR	Magnet Cove Generating Station	55714	SN-02	SRMV	none	427	6.34	1,404	37%
2012	AR	Oswald Generating Station	55221	G1	SRMV	none	82	8.09	45	6%

Year	State	Facility Name	Facility ID (ORISPL)	Unit ID	eGRID Sub-region	ISO / RTO	Capacity (MW)	Heat Rate (MMBtu/ MWh)	Generation (GWh)	Capacity Factor
2012	AR	Oswald Generating Station	55221	G2	SRMV	none	80	7.89	47	7%
2012	AR	Oswald Generating Station	55221	G3	SRMV	none	83	7.83	45	6%
2012	AR	Oswald Generating Station	55221	G4	SRMV	none	80	7.80	45	6%
2012	AR	Oswald Generating Station	55221	G5	SRMV	none	89	7.57	40	5%
2012	AR	Oswald Generating Station	55221	G6	SRMV	none	81	7.85	41	6%
2012	AR	Oswald Generating Station	55221	G7	SRMV	none	168	9.16	107	7%
2012	AR	Pine Bluff Energy Center	55075	CT-1	SRMV	none	305	6.73	2,106	79%
2012	AR	Union Power Station	55380	CTG-1	SRMV	none	268	8.01	1,048	45%
2012	AR	Union Power Station	55380	CTG-2	SRMV	none	273	7.96	1,062	44%
2012	AR	Union Power Station	55380	CTG-3	SRMV	none	270	8.04	939	40%
2012	AR	Union Power Station	55380	CTG-4	SRMV	none	276	8.08	937	39%
2012	AR	Union Power Station	55380	CTG-5	SRMV	none	262	8.11	1,252	54%
2012	AR	Union Power Station	55380	CTG-6	SRMV	none	261	8.12	1,103	48%
2012	AR	Union Power Station	55380	CTG-7	SRMV	none	265	8.01	1,346	58%
2012	AR	Union Power Station	55380	CTG-8	SRMV	none	263	8.05	1,310	57%

Year	State	Facility Name	Facility ID (ORISPL)	Unit ID	eGRID Sub-region	ISO / RTO	Capacity (MW)	Heat Rate (MMBtu/ MWh)	Generation (GWh)	Capacity Factor
2012	AR	Thomas Fitzhugh	201	2	SRMV	SPP	174	9.29	117	8%
2012	AZ	APS West Phoenix Power Plant	117	CC4	AZNM	none	119	8.84	101	10%
2012	AZ	APS West Phoenix Power Plant	117	CC5A	AZNM	none	313	7.40	1,139	41%
2012	AZ	APS West Phoenix Power Plant	117	CC5B	AZNM	none	275	7.41	904	37%
2012	AZ	Arlington Valley Energy Facility	55282	CTG1	AZNM	none	300	7.07	853	32%
2012	AZ	Arlington Valley Energy Facility	55282	CTG2	AZNM	none	302	7.04	942	36%
2012	AZ	Desert Basin Generating Station	55129	DBG1	AZNM	none	310	7.46	735	27%
2012	AZ	Desert Basin Generating Station	55129	DBG2	AZNM	none	306	7.40	424	16%
2012	AZ	Gila River Power Station	55306	1CTGA	AZNM	none	298	6.91	294	11%
2012	AZ	Gila River Power Station	55306	1CTGB	AZNM	none	299	6.87	367	14%
2012	AZ	Gila River Power Station	55306	2CTGA	AZNM	none	307	6.88	271	10%
2012	AZ	Gila River Power Station	55306	2CTGB	AZNM	none	310	6.92	403	15%
2012	AZ	Gila River Power Station	55306	3CTGA	AZNM	none	307	6.73	892	33%
2012	AZ	Gila River Power Station	55306	3CTGB	AZNM	none	305	6.70	902	34%
2012	AZ	Gila River Power Station	55306	4CTGA	AZNM	none	320	6.94	1,232	44%

Year	State	Facility Name	Facility ID (ORISPL)	Unit ID	eGRID Sub-region	ISO / RTO	Capacity (MW)	Heat Rate (MMBtu/ MWh)	Generation (GWh)	Capacity Factor
2012	AZ	Gila River Power Station	55306	4CTGB	AZNM	none	323	6.96	1,310	46%
2012	AZ	Griffith Energy Project	55124	P1	AZNM	none	309	7.06	817	30%
2012	AZ	Griffith Energy Project	55124	P2	AZNM	none	298	7.05	824	31%
2012	AZ	Kyrene Generating Station	147	K-7	AZNM	none	278	7.14	1,173	48%
2012	AZ	Mesquite Generating Station	55481	1	AZNM	none	333	6.72	1,407	48%
2012	AZ	Mesquite Generating Station	55481	2	AZNM	none	323	6.93	1,378	49%
2012	AZ	Mesquite Generating Station	55481	5	AZNM	none	328	6.99	1,653	57%
2012	AZ	Mesquite Generating Station	55481	6	AZNM	none	329	7.00	1,658	57%
2012	AZ	New Harquahala Generating Company, LLC	55372	CTG1	AZNM	none	244	11.05	363	17%
2012	AZ	New Harquahala Generating Company, LLC	55372	CTG2	AZNM	none	245	11.05	345	16%
2012	AZ	New Harquahala Generating Company, LLC	55372	CTG3	AZNM	none	242	10.98	236	11%
2012	AZ	Redhawk Generating Facility	55455	CC1A	AZNM	none	282	7.03	1,210	49%
2012	AZ	Redhawk Generating Facility	55455	CC1B	AZNM	none	281	7.05	1,122	45%
2012	AZ	Redhawk Generating Facility	55455	CC2A	AZNM	none	276	7.15	1,288	53%
2012	AZ	Redhawk Generating Facility	55455	CC2B	AZNM	none	276	7.22	1,220	50%

Year	State	Facility Name	Facility ID (ORISPL)	Unit ID	eGRID Sub-region	ISO / RTO	Capacity (MW)	Heat Rate (MMBtu/ MWh)	Generation (GWh)	Capacity Factor
2012	AZ	Santan	8068	5A	AZNM	none	308	7.44	759	28%
2012	AZ	Santan	8068	5B	AZNM	none	313	7.43	640	23%
2012	AZ	Santan	8068	6A	AZNM	none	307	7.15	1,207	45%
2012	AZ	South Point Energy Center, LLC	55177	A	AZNM	none	274	6.88	760	32%
2012	AZ	South Point Energy Center, LLC	55177	B	AZNM	none	276	6.73	683	28%
2012	CA	Calpine Gilroy Cogen, LP	10034	S-100	CAMX	CAISO	303	8.28	248	9%
2012	CA	Calpine Sutter Energy Center	55112	CT01	CAMX	CAISO	302	6.64	675	25%
2012	CA	Calpine Sutter Energy Center	55112	CT02	CAMX	CAISO	297	6.04	659	25%
2012	CA	Carson Cogeneration	7527	1	CAMX	CAISO	62	8.76	381	70%
2012	CA	Colusa Generating Station	56532	CT1	CAMX	CAISO	340	6.89	1,379	46%
2012	CA	Colusa Generating Station	56532	CT2	CAMX	CAISO	341	7.02	1,356	45%
2012	CA	Coolwater Generating Station	329	31	CAMX	CAISO	136	10.54	99	8%
2012	CA	Coolwater Generating Station	329	32	CAMX	CAISO	129	10.37	91	8%
2012	CA	Coolwater Generating Station	329	41	CAMX	CAISO	133	9.94	144	12%
2012	CA	Coolwater Generating Station	329	42	CAMX	CAISO	133	10.37	153	13%

Year	State	Facility Name	Facility ID (ORISPL)	Unit ID	eGRID Sub-region	ISO / RTO	Capacity (MW)	Heat Rate (MMBtu/ MWh)	Generation (GWh)	Capacity Factor
2012	CA	Delta Energy Center, LLC	55333	1	CAMX	CAISO	320	6.83	2,030	72%
2012	CA	Delta Energy Center, LLC	55333	2	CAMX	CAISO	320	7.04	1,858	66%
2012	CA	Delta Energy Center, LLC	55333	3	CAMX	CAISO	302	6.99	1,987	75%
2012	CA	Donald Von Raesfeld	56026	PCT1	CAMX	CAISO	77	7.50	479	71%
2012	CA	Donald Von Raesfeld	56026	PCT2	CAMX	CAISO	76	7.70	463	69%
2012	CA	Elk Hills Power	55400	CTG-1	CAMX	CAISO	288	6.27	1,755	69%
2012	CA	Elk Hills Power	55400	CTG-2	CAMX	CAISO	284	6.39	1,799	72%
2012	CA	Fresno Cogeneration Partners, LP	10156	GEN1	CAMX	CAISO	48	11.33	20	5%
2012	CA	Gateway Generating Station	56476	GT1	CAMX	CAISO	310	6.97	1,615	59%
2012	CA	Gateway Generating Station	56476	GT2	CAMX	CAISO	301	7.15	1,656	63%
2012	CA	Gilroy Energy Center, LLC for King City	10294	2	CAMX	CAISO	49	11.39	13	3%
2012	CA	High Desert Power Project	55518	CTG1	CAMX	CAISO	170	11.19	1,070	72%
2012	CA	High Desert Power Project	55518	CTG2	CAMX	CAISO	172	11.15	1,054	70%
2012	CA	High Desert Power Project	55518	CTG3	CAMX	CAISO	171	11.08	1,091	73%
2012	CA	Inland Empire Energy Center	55853	1	CAMX	CAISO	392	6.56	2,082	60%

Year	State	Facility Name	Facility ID (ORISPL)	Unit ID	eGRID Sub-region	ISO / RTO	Capacity (MW)	Heat Rate (MMBtu/ MWh)	Generation (GWh)	Capacity Factor
2012	CA	Inland Empire Energy Center	55853	2	CAMX	CAISO	385	6.76	1,548	46%
2012	CA	La Paloma Generating Plant	55151	CTG-1	CAMX	CAISO	250	6.88	1,644	75%
2012	CA	La Paloma Generating Plant	55151	CTG-2	CAMX	CAISO	250	6.99	1,382	63%
2012	CA	La Paloma Generating Plant	55151	CTG-3	CAMX	CAISO	250	6.92	1,394	63%
2012	CA	La Paloma Generating Plant	55151	CTG-4	CAMX	CAISO	250	7.02	1,214	55%
2012	CA	Los Medanos Energy Center, LLC	55217	X724	CAMX	CAISO	309	6.73	2,048	75%
2012	CA	Los Medanos Energy Center, LLC	55217	X725	CAMX	CAISO	312	6.75	1,950	71%
2012	CA	Malburg Generating Station	56041	M1	CAMX	CAISO	84	7.67	315	43%
2012	CA	Malburg Generating Station	56041	M2	CAMX	CAISO	86	7.67	410	54%
2012	CA	Metcalf Energy Center	55393	1	CAMX	CAISO	310	6.92	1,464	54%
2012	CA	Metcalf Energy Center	55393	2	CAMX	CAISO	306	6.99	1,403	52%
2012	CA	Otay Mesa Energy Center, LLC	55345	CTG-1	CAMX	CAISO	313	6.88	2,005	73%
2012	CA	Otay Mesa Energy Center, LLC	55345	CTG-2	CAMX	CAISO	313	6.88	1,956	71%
2012	CA	Palomar Energy Center	55985	CTG1	CAMX	CAISO	286	6.94	1,408	56%
2012	CA	Palomar Energy Center	55985	CTG2	CAMX	CAISO	286	6.92	1,435	57%

Year	State	Facility Name	Facility ID (ORISPL)	Unit ID	eGRID Sub-region	ISO / RTO	Capacity (MW)	Heat Rate (MMBtu/ MWh)	Generation (GWh)	Capacity Factor
2012	CA	Pastoria Energy Facility	55656	CT001	CAMX	CAISO	267	6.77	1,520	65%
2012	CA	Pastoria Energy Facility	55656	CT002	CAMX	CAISO	262	6.79	1,556	68%
2012	CA	Pastoria Energy Facility	55656	CT004	CAMX	CAISO	264	6.86	1,455	63%
2012	CA	Roseville Energy Park	56298	CT001	CAMX	CAISO	89	7.49	288	37%
2012	CA	Roseville Energy Park	56298	CT002	CAMX	CAISO	85	7.49	306	41%
2012	CA	Sunrise Power Company	55182	CTG1	CAMX	CAISO	303	6.89	1,168	44%
2012	CA	Sunrise Power Company	55182	CTG2	CAMX	CAISO	306	6.82	1,081	40%
2012	CA	Woodland Generation Station	7266	2	CAMX	CAISO	86	8.24	334	44%
2012	CA	Blythe Energy	55295	1	CAMX	none	186	10.73	579	35%
2012	CA	Blythe Energy	55295	2	CAMX	none	185	10.76	597	37%
2012	CA	Carson Cogeneration Company	10169	D1	CAMX	none	56	7.93	425	86%
2012	CA	Harbor Generating Station	399	**10A	CAMX	none	147	9.29	58	5%
2012	CA	Harbor Generating Station	399	**10B	CAMX	none	120	8.84	50	5%
2012	CA	Haynes Generating Station	400	9	CAMX	none	299	6.96	668	25%
2012	CA	Haynes Generating Station	400	10	CAMX	none	296	6.96	700	27%

Year	State	Facility Name	Facility ID (ORISPL)	Unit ID	eGRID Sub-region	ISO / RTO	Capacity (MW)	Heat Rate (MMBtu/ MWh)	Generation (GWh)	Capacity Factor
2012	CA	Magnolia	56046	1	CAMX	none	305	6.86	1,473	55%
2012	CA	Redding Power Plant	7307	5	CAMX	none	47	11.65	8	2%
2012	CA	Sacramento Power Authority Cogen	7552	1	CAMX	none	193	7.20	607	36%
2012	CA	SCA Cogen II	7551	1A	CAMX	none	65	8.85	354	62%
2012	CA	SCA Cogen II	7551	1B	CAMX	none	63	8.93	348	63%
2012	CA	Valley Generating Station	408	6	CAMX	none	278	6.91	1,618	66%
2012	CA	Valley Generating Station	408	7	CAMX	none	277	6.94	1,698	70%
2012	CA	Walnut Energy Center	56078	1	CAMX	none	144	7.94	727	57%
2012	CA	Walnut Energy Center	56078	2	CAMX	none	140	7.92	779	63%
2012	CO	Arapahoe Combustion Turbine Facility	55200	CT5	RMPA	none	67	8.24	48	8%
2012	CO	Arapahoe Combustion Turbine Facility	55200	CT6	RMPA	none	69	8.32	50	8%
2012	CO	Brush Power Projects	10682	GT4	RMPA	none	77	10.59	16	2%
2012	CO	Brush Power Projects	10682	GT5	RMPA	none	77	10.58	15	2%
2012	CO	Fort St. Vrain	6112	2	RMPA	none	264	7.22	1,216	52%
2012	CO	Fort St. Vrain	6112	3	RMPA	none	276	7.18	1,070	44%

Year	State	Facility Name	Facility ID (ORISPL)	Unit ID	eGRID Sub-region	ISO / RTO	Capacity (MW)	Heat Rate (MMBtu/ MWh)	Generation (GWh)	Capacity Factor
2012	CO	Fort St. Vrain	6112	4	RMPA	none	258	7.56	1,113	49%
2012	CO	Front Range Power Plant	55283	1	RMPA	none	267	7.82	631	27%
2012	CO	Front Range Power Plant	55283	2	RMPA	none	267	7.51	724	31%
2012	CO	J M Shafer	50707	S001	RMPA	none	37	12.47	144	44%
2012	CO	J M Shafer	50707	S002	RMPA	none	37	11.82	118	36%
2012	CO	J M Shafer	50707	S003	RMPA	none	37	11.38	99	30%
2012	CO	J M Shafer	50707	S004	RMPA	none	37	12.10	123	38%
2012	CO	J M Shafer	50707	S005	RMPA	none	37	12.04	140	43%
2012	CO	Rocky Mountain Energy Center	55835	1	RMPA	none	334	7.46	1,217	41%
2012	CO	Rocky Mountain Energy Center	55835	2	RMPA	none	311	7.41	1,318	48%
2012	CT	Algonquin Power Windsor Locks, LLC	10567	GT1	NEWE	ISONE	49	12.26	90	21%
2012	CT	Bridgeport Energy	55042	BE1	NEWE	ISONE	176	7.05	1,476	95%
2012	CT	Bridgeport Energy	55042	BE2	NEWE	ISONE	177	7.03	1,490	96%
2012	CT	Capitol District Energy Center	50498	GT	NEWE	ISONE	79	9.75	25	4%
2012	CT	Lake Road Generating Company	55149	LRG1	NEWE	ISONE	212	10.95	926	50%

Year	State	Facility Name	Facility ID (ORISPL)	Unit ID	eGRID Sub-region	ISO / RTO	Capacity (MW)	Heat Rate (MMBtu/ MWh)	Generation (GWh)	Capacity Factor
2012	CT	Lake Road Generating Company	55149	LRG2	NEWE	ISONE	217	10.45	1,074	56%
2012	CT	Lake Road Generating Company	55149	LRG3	NEWE	ISONE	216	10.74	1,036	55%
2012	CT	Milford Power Company LLC	55126	CT01	NEWE	ISONE	290	6.84	1,963	77%
2012	CT	Milford Power Company LLC	55126	CT02	NEWE	ISONE	295	6.92	1,777	69%
2012	CT	Pratt & Whitney, East Hartford	54605	1	NEWE	ISONE	32	11.05	48	17%
2012	DE	Hay Road	7153	1	RFCE	PJM	127	12.60	494	44%
2012	DE	Hay Road	7153	2	RFCE	PJM	127	12.33	564	51%
2012	DE	Hay Road	7153	**3	RFCE	PJM	129	12.24	609	54%
2012	FL	Arvah B Hopkins	688	2A	FRCC	none	329	7.51	1,278	44%
2012	FL	Auburndale Cogeneration Facility	54658	1	FRCC	none	158	8.30	924	67%
2012	FL	C D McIntosh Jr Power Plant	676	5	FRCC	none	235	10.04	1,579	76%
2012	FL	Cane Island	7238	2	FRCC	none	122	8.51	171	16%
2012	FL	Cane Island	7238	3	FRCC	none	268	7.13	1,298	55%
2012	FL	Cane Island	7238	4	FRCC	none	336	6.94	1,347	46%
2012	FL	Charles Larsen Memorial Power Plant	675	**8	FRCC	none	93	13.71	30	4%

Year	State	Facility Name	Facility ID (ORISPL)	Unit ID	eGRID Sub-region	ISO / RTO	Capacity (MW)	Heat Rate (MMBtu/ MWh)	Generation (GWh)	Capacity Factor
2012	FL	Curtis H. Stanton Energy Center	564	CCB	FRCC	none	319	6.63	1,397	50%
2012	FL	Fort Myers	612	FMCT2A	FRCC	none	178	11.03	954	61%
2012	FL	Fort Myers	612	FMCT2B	FRCC	none	179	11.04	1,010	64%
2012	FL	Fort Myers	612	FMCT2C	FRCC	none	174	11.20	993	65%
2012	FL	Fort Myers	612	FMCT2D	FRCC	none	180	11.12	972	61%
2012	FL	Fort Myers	612	FMCT2E	FRCC	none	178	11.16	999	64%
2012	FL	Fort Myers	612	FMCT2F	FRCC	none	180	10.85	978	62%
2012	FL	Hardee Power Station	50949	CT1A	FRCC	none	88	12.38	200	26%
2012	FL	Hardee Power Station	50949	CT1B	FRCC	none	90	12.56	214	27%
2012	FL	Hines Energy Complex	7302	1A	FRCC	none	203	10.63	1,110	62%
2012	FL	Hines Energy Complex	7302	1B	FRCC	none	203	10.81	1,081	61%
2012	FL	Hines Energy Complex	7302	2A	FRCC	none	195	11.02	1,150	67%
2012	FL	Hines Energy Complex	7302	2B	FRCC	none	195	11.07	1,013	59%
2012	FL	Hines Energy Complex	7302	3A	FRCC	none	196	11.13	921	53%
2012	FL	Hines Energy Complex	7302	3B	FRCC	none	195	11.12	1,000	58%

Year	State	Facility Name	Facility ID (ORISPL)	Unit ID	eGRID Sub-region	ISO / RTO	Capacity (MW)	Heat Rate (MMBtu/ MWh)	Generation (GWh)	Capacity Factor
2012	FL	Hines Energy Complex	7302	4A	FRCC	none	190	10.30	1,041	62%
2012	FL	Hines Energy Complex	7302	4B	FRCC	none	189	10.49	1,092	66%
2012	FL	J R Kelly	664	CC1	FRCC	none	90	12.30	365	46%
2012	FL	Lake Cogeneration	54423	EU003	FRCC	none	62	8.67	249	46%
2012	FL	Lake Cogeneration	54423	EU004	FRCC	none	62	8.66	260	48%
2012	FL	Lauderdale	613	4GT1	FRCC	none	172	7.94	1,177	78%
2012	FL	Lauderdale	613	4GT2	FRCC	none	175	7.99	1,166	76%
2012	FL	Lauderdale	613	5GT1	FRCC	none	169	7.96	1,091	73%
2012	FL	Lauderdale	613	5GT2	FRCC	none	175	7.90	1,119	73%
2012	FL	Manatee	6042	MTCT3A	FRCC	none	882	6.79	1,660	21%
2012	FL	Martin	6043	HRSG3A	FRCC	none	334	7.23	1,431	49%
2012	FL	Martin	6043	HRSG4A	FRCC	none	339	7.24	1,303	44%
2012	FL	Martin	6043	PMR8A	FRCC	none	196	7.41	1,761	102%
2012	FL	Martin	6043	PMR8B	FRCC	none	198	7.66	1,492	86%
2012	FL	Martin	6043	PMR8C	FRCC	none	288	7.25	1,642	65%

Year	State	Facility Name	Facility ID (ORISPL)	Unit ID	eGRID Sub-region	ISO / RTO	Capacity (MW)	Heat Rate (MMBtu/ MWh)	Generation (GWh)	Capacity Factor
2012	FL	Martin	6043	PMR8D	FRCC	none	211	7.16	1,723	93%
2012	FL	Midulla Generating Station	7380	1	FRCC	none	185	11.42	741	46%
2012	FL	Midulla Generating Station	7380	2	FRCC	none	200	11.32	926	53%
2012	FL	Orlando CoGen	54466	1	FRCC	none	139	8.32	823	67%
2012	FL	Osprey Energy Center	55412	CT1	FRCC	none	311	7.22	1,682	62%
2012	FL	Osprey Energy Center	55412	CT2	FRCC	none	312	7.18	1,520	55%
2012	FL	P L Bartow	634	4A	FRCC	none	423	7.45	1,780	48%
2012	FL	P L Bartow	634	4B	FRCC	none	348	7.63	1,780	58%
2012	FL	P L Bartow	634	4C	FRCC	none	366	7.50	1,705	53%
2012	FL	P L Bartow	634	4D	FRCC	none	338	7.53	1,598	54%
2012	FL	Pasco Cogeneration	54424	EU001	FRCC	none	61	8.80	119	22%
2012	FL	Pasco Cogeneration	54424	EU002	FRCC	none	60	8.74	126	24%
2012	FL	Putnam	6246	HRSG11	FRCC	none	276	9.54	193	8%
2012	FL	Putnam	6246	HRSG21	FRCC	none	273	9.51	275	11%
2012	FL	Reedy Creek	7254	32432	FRCC	None	49	9.89	354	82%

Year	State	Facility Name	Facility ID (ORISPL)	Unit ID	eGRID Sub-region	ISO / RTO	Capacity (MW)	Heat Rate (MMBtu/ MWh)	Generation (GWh)	Capacity Factor
2012	FL	Roy E Hansel Power Plant	672	CT21	FRCC	none	50	11.39	43	10%
2012	FL	S O Purdom	689	8	FRCC	none	189	12.89	645	39%
2012	FL	Sanford	620	SNCT4A	FRCC	none	193	9.31	1,091	64%
2012	FL	Sanford	620	SNCT4B	FRCC	none	192	9.45	1,097	65%
2012	FL	Sanford	620	SNCT4C	FRCC	none	192	9.22	1,120	66%
2012	FL	Sanford	620	SNCT4D	FRCC	none	195	9.21	1,211	71%
2012	FL	Sanford	620	SNCT5A	FRCC	none	193	8.73	848	50%
2012	FL	Sanford	620	SNCT5B	FRCC	none	188	8.76	934	57%
2012	FL	Sanford	620	SNCT5C	FRCC	none	192	8.92	947	56%
2012	FL	Sanford	620	SNCT5D	FRCC	none	190	8.53	828	50%
2012	FL	Stanton A	55821	25	FRCC	none	344	7.15	1,215	40%
2012	FL	Stanton A	55821	26	FRCC	none	348	7.03	1,053	34%
2012	FL	Tiger Bay	7699	1	FRCC	none	165	11.00	836	58%
2012	FL	Treasure Coast Energy Center	56400	1	FRCC	none	345	6.88	1,949	64%
2012	FL	Turkey Point	621	TPCT5A	FRCC	none	308	6.83	1,698	63%

Year	State	Facility Name	Facility ID (ORISPL)	Unit ID	eGRID Sub-region	ISO / RTO	Capacity (MW)	Heat Rate (MMBtu/ MWh)	Generation (GWh)	Capacity Factor
2012	FL	Turkey Point	621	TPCT5B	FRCC	none	311	6.80	1,729	63%
2012	FL	Turkey Point	621	TPCT5C	FRCC	none	315	6.86	1,665	60%
2012	FL	Turkey Point	621	TPCT5D	FRCC	none	314	6.85	1,679	61%
2012	FL	Vero Beach Municipal	693	**5	FRCC	none	43	11.84	15	4%
2012	FL	West County Energy Center	56407	WCCT1A	FRCC	none	475	6.65	2,808	67%
2012	FL	West County Energy Center	56407	WCCT2A	FRCC	none	452	6.70	2,692	68%
2012	FL	Lansing Smith Generating Plant	643	4	SRSO	none	361	7.09	1,902	60%
2012	FL	Lansing Smith Generating Plant	643	5	SRSO	none	318	6.67	1,979	71%
2012	FL	Santa Rosa Energy Center	55242	CT-1	SRSO	none	260	7.26	890	39%
2012	GA	Chattahoochee Energy Facility	7917	8A	SRSO	none	176	9.73	993	64%
2012	GA	Chattahoochee Energy Facility	7917	8B	SRSO	none	176	9.68	863	56%
2012	GA	Effingham County Power, LLC	55406	1	SRSO	none	189	11.00	753	45%
2012	GA	Effingham County Power, LLC	55406	2	SRSO	none	187	10.76	844	51%
2012	GA	McIntosh Combined Cycle Facility	56150	10A	SRSO	none	341	6.78	1,776	59%
2012	GA	McIntosh Combined Cycle Facility	56150	10B	SRSO	none	344	6.87	1,928	64%

Year	State	Facility Name	Facility ID (ORISPL)	Unit ID	eGRID Sub-region	ISO / RTO	Capacity (MW)	Heat Rate (MMBtu/ MWh)	Generation (GWh)	Capacity Factor
2012	GA	McIntosh Combined Cycle Facility	56150	11A	SRSO	none	347	6.97	1,942	64%
2012	GA	McIntosh Combined Cycle Facility	56150	11B	SRSO	none	354	6.96	1,931	62%
2012	GA	Mid-Georgia Cogeneration	55040	1	SRSO	none	181	8.14	189	12%
2012	GA	Mid-Georgia Cogeneration	55040	2	SRSO	none	181	8.07	204	13%
2012	GA	Thomas A. Smith Energy Facility	55382	CCCT1	SRSO	none	398	7.06	1,212	35%
2012	GA	Thomas A. Smith Energy Facility	55382	CCCT2	SRSO	none	334	7.06	1,186	40%
2012	GA	Thomas A. Smith Energy Facility	55382	CCCT3	SRSO	none	344	7.11	956	32%
2012	GA	Thomas A. Smith Energy Facility	55382	CCCT4	SRSO	none	348	7.07	818	27%
2012	GA	Wansley (7946)	7946	CT9A	SRSO	none	206	9.98	671	37%
2012	GA	Wansley (7946)	7946	CT9B	SRSO	none	206	10.14	608	34%
2012	IA	Emery Station	8031	11	MROW	MISO	302	7.23	450	17%
2012	IA	Emery Station	8031	12	MROW	MISO	305	7.15	452	17%
2012	IA	Greater Des Moines Energy Center	7985	1	MROW	MISO	200	11.03	177	10%
2012	IA	Greater Des Moines Energy Center	7985	2	MROW	MISO	200	10.97	185	11%
2012	ID	Rathdrum Power, LLC	55179	CTGEN1	NWPP	none	285	6.91	1,234	49%

Year	State	Facility Name	Facility ID (ORISPL)	Unit ID	eGRID Sub-region	ISO / RTO	Capacity (MW)	Heat Rate (MMBtu/ MWh)	Generation (GWh)	Capacity Factor
2012	IL	Cordova Energy Company	55188	1	MROW	PJM	282	7.91	2	0%
2012	IL	Cordova Energy Company	55188	2	MROW	PJM	295	7.96	2	0%
2012	IL	Kendall Energy Facility	55131	GTG-1	RFCW	PJM	307	7.31	1,135	42%
2012	IL	Kendall Energy Facility	55131	GTG-2	RFCW	PJM	315	7.39	1,237	45%
2012	IL	Kendall Energy Facility	55131	GTG-3	RFCW	PJM	322	7.36	1,333	47%
2012	IL	Kendall Energy Facility	55131	GTG-4	RFCW	PJM	316	7.30	1,246	45%
2012	IL	Morris Cogeneration, LLC	55216	CTG1	RFCW	PJM	97	10.75	89	10%
2012	IL	Morris Cogeneration, LLC	55216	CTG2	RFCW	PJM	101	10.51	97	11%
2012	IL	Morris Cogeneration, LLC	55216	CTG3	RFCW	PJM	93	10.79	92	11%
2012	IL	Holland Energy Facility	55334	CTG1	SRMW	MISO	348	7.22	548	18%
2012	IL	Holland Energy Facility	55334	CTG2	SRMW	MISO	338	7.21	542	18%
2012	IL	Grand Tower	862	CT01	SRMW	none	246	8.25	371	17%
2012	IL	Grand Tower	862	CT02	SRMW	none	278	7.94	931	38%
2012	IN	Sugar Creek Generating Station	55364	CT11	RFCW	MISO	302	6.93	1,600	60%
2012	IN	Sugar Creek Generating Station	55364	CT12	RFCW	MISO	329	6.92	1,605	56%

Year	State	Facility Name	Facility ID (ORISPL)	Unit ID	eGRID Sub-region	ISO / RTO	Capacity (MW)	Heat Rate (MMBtu/ MWh)	Generation (GWh)	Capacity Factor
2012	IN	Whiting Clean Energy, Inc.	55259	CT1	RFCW	MISO	183	14.27	791	49%
2012	IN	Whiting Clean Energy, Inc.	55259	CT2	RFCW	MISO	181	14.44	854	54%
2012	IN	Noblesville	1007	CT3	RFCW	none	75	10.78	183	28%
2012	IN	Noblesville	1007	CT4	RFCW	none	75	10.90	206	31%
2012	IN	Noblesville	1007	CT5	RFCW	none	75	11.11	202	31%
2012	IN	Lawrenceburg Energy Facility	55502	1	RFCW	PJM	333	7.03	1,762	60%
2012	IN	Lawrenceburg Energy Facility	55502	2	RFCW	PJM	328	6.84	1,729	60%
2012	IN	Lawrenceburg Energy Facility	55502	3	RFCW	PJM	330	7.10	1,704	59%
2012	IN	Lawrenceburg Energy Facility	55502	4	RFCW	PJM	329	7.10	1,583	55%
2012	LA	Acadia Power Station	55173	CT1	SPSO	SPP	320	7.05	1,287	46%
2012	LA	Acadia Power Station	55173	CT2	SPSO	SPP	300	7.04	1,341	51%
2012	LA	Acadia Power Station	55173	CT3	SPSO	SPP	310	7.05	1,141	42%
2012	LA	Acadia Power Station	55173	CT4	SPSO	SPP	300	7.08	1,145	43%
2012	LA	Arsenal Hill Power Plant	1416	CTG-6A	SPSO	SPP	374	10.57	1,209	37%
2012	LA	Carville Energy Center	55404	COG01	SRMV	none	271	7.55	1,603	67%

Year	State	Facility Name	Facility ID (ORISPL)	Unit ID	eGRID Sub-region	ISO / RTO	Capacity (MW)	Heat Rate (MMBtu/ MWh)	Generation (GWh)	Capacity Factor
2012	LA	Carville Energy Center	55404	COG02	SRMV	none	312	7.69	1,523	56%
2012	LA	Ouachita Plant	55467	CTGEN1	SRMV	none	296	6.92	642	25%
2012	LA	Plaquemine Cogen Facility	55419	500	SRMV	none	402	6.13	2,493	71%
2012	LA	Plaquemine Cogen Facility	55419	600	SRMV	none	419	6.18	2,315	63%
2012	LA	Plaquemine Cogen Facility	55419	700	SRMV	none	403	6.05	2,470	70%
2012	LA	Plaquemine Cogen Facility	55419	800	SRMV	none	388	6.22	2,630	77%
2012	LA	R S Cogen	55117	RS-5	SRMV	none	242	9.07	1,501	71%
2012	LA	R S Cogen	55117	RS-6	SRMV	none	250	9.04	1,529	70%
2012	LA	Sterlington	1404	7AB	SRMV	none	96	12.41	3	0%
2012	LA	Sterlington	1404	7C	SRMV	none	100	11.76	3	0%
2012	LA	Taft Cogeneration Facility	55089	CT1	SRMV	none	195	11.58	1,113	65%
2012	LA	Taft Cogeneration Facility	55089	CT2	SRMV	none	192	11.48	1,300	77%
2012	LA	Taft Cogeneration Facility	55089	CT3	SRMV	none	192	11.53	1,107	66%
2012	MA	ANP Bellingham Energy Company, LLC	55211	1	NEWE	ISONE	189	11.45	465	28%
2012	MA	ANP Bellingham Energy Company, LLC	55211	2	NEWE	ISONE	187	11.33	714	43%

Year	State	Facility Name	Facility ID (ORISPL)	Unit ID	eGRID Sub-region	ISO / RTO	Capacity (MW)	Heat Rate (MMBtu/ MWh)	Generation (GWh)	Capacity Factor
2012	MA	ANP Blackstone Energy Company, LLC	55212	1	NEWE	ISONE	182	10.69	697	44%
2012	MA	ANP Blackstone Energy Company, LLC	55212	2	NEWE	ISONE	181	10.41	713	45%
2012	MA	Bellingham	10307	1	NEWE	ISONE	124	11.36	141	13%
2012	MA	Bellingham	10307	2	NEWE	ISONE	123	11.54	148	14%
2012	MA	Berkshire Power	55041	1	NEWE	ISONE	272	7.24	782	33%
2012	MA	Dartmouth Power	52026	1	NEWE	ISONE	73	8.15	144	22%
2012	MA	Dighton	55026	1	NEWE	ISONE	181	7.71	665	42%
2012	MA	Fore River Station	55317	11	NEWE	ISONE	424	6.91	2,081	56%
2012	MA	Fore River Station	55317	12	NEWE	ISONE	417	7.20	2,053	56%
2012	MA	General Electric Aircraft	10029	5	NEWE	ISONE	19		0	0%
2012	MA	Kendall Square	1595	4	NEWE	ISONE	308	6.66	1,776	66%
2012	MA	L'Energia Energy Center	54586	2	NEWE	ISONE	81	8.04	155	22%
2012	MA	Lowell Cogeneration Company	10802	1	NEWE	ISONE	31	10.55	4	1%
2012	MA	Milford Power, LP	54805	1	NEWE	ISONE	126	11.15	289	26%
2012	MA	Millennium Power Partners	55079	1	NEWE	ISONE	265	10.56	1,359	58%

Year	State	Facility Name	Facility ID (ORISPL)	Unit ID	eGRID Sub-region	ISO / RTO	Capacity (MW)	Heat Rate (MMBtu/ MWh)	Generation (GWh)	Capacity Factor
2012	MA	Mystic	1588	81	NEWE	ISONE	294	7.00	2,201	85%
2012	MA	Mystic	1588	82	NEWE	ISONE	296	6.99	2,126	82%
2012	MA	Mystic	1588	93	NEWE	ISONE	299	7.07	2,168	83%
2012	MA	Mystic	1588	94	NEWE	ISONE	299	7.07	2,149	82%
2012	MA	Pittsfield Generating	50002	1	NEWE	ISONE	45	12.20	66	17%
2012	MA	Pittsfield Generating	50002	2	NEWE	ISONE	46	12.35	76	19%
2012	MA	Pittsfield Generating	50002	3	NEWE	ISONE	44	12.24	66	17%
2012	MA	Potter	1660	3	NEWE	ISONE	70	14.12	7	1%
2012	MD	Panda Brandywine	54832	1	RFCE	PJM	140	8.02	345	28%
2012	MD	Panda Brandywine	54832	2	RFCE	PJM	160	7.77	359	26%
2012	ME	Bucksport Clean Energy	50243	GEN4	NEWE	ISONE	193	9.59	1,400	83%
2012	ME	Maine Independence Station	55068	1	NEWE	ISONE	191	11.73	397	24%
2012	ME	Maine Independence Station	55068	2	NEWE	ISONE	189	11.63	371	22%
2012	ME	Rumford Power	55100	1	NEWE	ISONE	282	7.35	380	15%
2012	ME	Westbrook Energy Center	55294	1	NEWE	ISONE	309	6.60	1,355	50%

Year	State	Facility Name	Facility ID (ORISPL)	Unit ID	eGRID Sub-region	ISO / RTO	Capacity (MW)	Heat Rate (MMBtu/ MWh)	Generation (GWh)	Capacity Factor
2012	ME	Westbrook Energy Center	55294	2	NEWE	ISONE	309	6.66	1,233	45%
2012	MI	Jackson MI Facility	55270	7EA	RFCM	MISO	150	8.06	558	42%
2012	MI	Jackson MI Facility	55270	LM1	RFCM	MISO	74	8.51	196	30%
2012	MI	Jackson MI Facility	55270	LM2	RFCM	MISO	73	8.04	201	31%
2012	MI	Jackson MI Facility	55270	LM3	RFCM	MISO	73	8.40	197	31%
2012	MI	Jackson MI Facility	55270	LM4	RFCM	MISO	72	8.76	187	30%
2012	MI	Jackson MI Facility	55270	LM5	RFCM	MISO	74	8.37	202	31%
2012	MI	Jackson MI Facility	55270	LM6	RFCM	MISO	74	8.52	201	31%
2012	MI	Michigan Power Limited Partnership	54915	1	RFCM	MISO	137	9.38	1,019	85%
2012	MI	Midland Cogeneration Venture	10745	3	RFCM	MISO	104	10.86	426	47%
2012	MI	Midland Cogeneration Venture	10745	4	RFCM	MISO	104	10.90	335	37%
2012	MI	Midland Cogeneration Venture	10745	5	RFCM	MISO	106	11.59	352	38%
2012	MI	Midland Cogeneration Venture	10745	6	RFCM	MISO	104	11.12	595	65%
2012	MI	Midland Cogeneration Venture	10745	7	RFCM	MISO	104	11.29	362	40%
2012	MI	Midland Cogeneration Venture	10745	8	RFCM	MISO	104	11.16	386	42%

Year	State	Facility Name	Facility ID (ORISPL)	Unit ID	eGRID Sub-region	ISO / RTO	Capacity (MW)	Heat Rate (MMBtu/ MWh)	Generation (GWh)	Capacity Factor
2012	MI	Midland Cogeneration Venture	10745	9	RFCM	MISO	104	11.50	373	41%
2012	MI	Midland Cogeneration Venture	10745	10	RFCM	MISO	104	11.36	410	45%
2012	MI	Midland Cogeneration Venture	10745	11	RFCM	MISO	104	11.44	334	37%
2012	MI	Midland Cogeneration Venture	10745	12	RFCM	MISO	104	11.99	726	79%
2012	MI	Midland Cogeneration Venture	10745	13	RFCM	MISO	104	11.81	342	37%
2012	MI	Midland Cogeneration Venture	10745	14	RFCM	MISO	104	11.62	485	53%
2012	MI	New Covert Generating Project	55297	1	RFCM	MISO	402	6.85	1,496	42%
2012	MI	New Covert Generating Project	55297	2	RFCM	MISO	402	6.84	1,294	37%
2012	MI	New Covert Generating Project	55297	3	RFCM	MISO	382	6.77	1,375	41%
2012	MI	Otsego Paper, Inc.	55799	25	RFCM	MISO	17	11.60	33	22%
2012	MI	Zeeland Generating Station	55087	CC3	RFCM	MISO	217	10.86	840	44%
2012	MI	Zeeland Generating Station	55087	CC4	RFCM	MISO	193	11.37	864	51%
2012	MN	Black Dog	1904	5	MROW	MISO	311	7.36	182	7%
2012	MN	Cottage Grove Cogeneration	55010	1	MROW	MISO	340	7.00	615	21%
2012	MN	Faribault Energy Park	56164	EU006	MROW	MISO	299	6.99	788	30%

Year	State	Facility Name	Facility ID (ORISPL)	Unit ID	eGRID Sub-region	ISO / RTO	Capacity (MW)	Heat Rate (MMBtu/ MWh)	Generation (GWh)	Capacity Factor
2012	MN	High Bridge	1912	7	MROW	MISO	301	7.19	1,014	38%
2012	MN	High Bridge	1912	8	MROW	MISO	305	7.13	878	33%
2012	MN	Hutchinson - Plant 2	6358	1	MROW	MISO	53	13.03	19	4%
2012	MN	Mankato Energy Center	56104	CT-2	MROW	MISO	377	7.26	522	16%
2012	MN	Riverside (1927)	1927	9	MROW	MISO	306	6.79	1,067	40%
2012	MN	Riverside (1927)	1927	10	MROW	MISO	306	6.75	919	34%
2012	MO	Dogwood Energy Facility	55178	CT-1	SPNO	SPP	316	7.15	734	26%
2012	MO	Dogwood Energy Facility	55178	CT-2	SPNO	SPP	319	7.12	847	30%
2012	MO	Hawthorn	2079	9	SPNO	SPP	285	8.23	214	9%
2012	MO	St. Francis Power Plant	7604	1	SRMW	none	250	7.24	654	30%
2012	MO	St. Francis Power Plant	7604	2	SRMW	none	253	7.01	585	26%
2012	MS	Attala Generating Plant	55220	A01	SRMV	none	169	9.90	611	41%
2012	MS	Attala Generating Plant	55220	A02	SRMV	none	170	9.95	608	41%
2012	MS	Choctaw County Gen	55706	CTG1	SRMV	none	173		0	0%
2012	MS	Choctaw County Gen	55706	CTG2	SRMV	none	175	10.80	308	20%

Year	State	Facility Name	Facility ID (ORISPL)	Unit ID	eGRID Sub-region	ISO / RTO	Capacity (MW)	Heat Rate (MMBtu/ MWh)	Generation (GWh)	Capacity Factor
2012	MS	Choctaw County Gen	55706	CTG3	SRMV	none	186	10.83	260	16%
2012	MS	Hinds Energy Facility	55218	H01	SRMV	none	180	9.70	272	17%
2012	MS	Hinds Energy Facility	55218	H02	SRMV	none	183	9.73	287	18%
2012	MS	Southaven Combined Cycle	55269	AA-001	SRMV	none	300	6.98	1,490	57%
2012	MS	Southaven Combined Cycle	55269	AA-002	SRMV	none	300	6.90	1,427	54%
2012	MS	Daniel Electric Generating Plant	6073	3A	SRSO	none	196	10.51	1,306	76%
2012	MS	Daniel Electric Generating Plant	6073	3B	SRSO	none	192	10.44	1,302	77%
2012	MS	Daniel Electric Generating Plant	6073	4A	SRSO	none	199	10.24	1,333	76%
2012	MS	Daniel Electric Generating Plant	6073	4B	SRSO	none	190	10.11	1,324	79%
2012	MS	Moselle Generating Plant	2070	7	SRSO	none	96	8.98	592	70%
2012	MS	Quantum Choctaw Power, LLC	55694	AA-001	SRSO	none	442	6.63	1,516	39%
2012	MS	Quantum Choctaw Power, LLC	55694	AA-002	SRSO	none	432	6.56	1,543	41%
2012	MS	Batesville Generation Facility	55063	1	SRTV	none	308	7.73	976	36%
2012	MS	Batesville Generation Facility	55063	2	SRTV	none	307	7.75	787	29%
2012	MS	Batesville Generation Facility	55063	3	SRTV	none	318	7.62	1,456	52%

Year	State	Facility Name	Facility ID (ORISPL)	Unit ID	eGRID Sub-region	ISO / RTO	Capacity (MW)	Heat Rate (MMBtu/ MWh)	Generation (GWh)	Capacity Factor
2012	MS	Caledonia	55197	AA-001	SRTV	none	301	6.97	1,583	60%
2012	MS	Caledonia	55197	AA-002	SRTV	none	300	7.02	1,497	57%
2012	MS	Magnolia Facility	55451	CTG-1	SRTV	none	342	7.49	1,351	45%
2012	MS	Magnolia Facility	55451	CTG-2	SRTV	none	333	7.49	1,678	57%
2012	MS	Magnolia Facility	55451	CTG-3	SRTV	none	342	7.46	1,607	53%
2012	NC	Plant Rowan County	7826	4	SRVC	none	176	11.04	987	64%
2012	NC	Plant Rowan County	7826	5	SRVC	none	180	11.00	1,012	64%
2012	NC	Richmond County Plant	7805	7	SRVC	none	187	10.94	931	57%
2012	NC	Richmond County Plant	7805	8	SRVC	none	188	10.99	894	54%
2012	NC	Richmond County Plant	7805	9	SRVC	none	345	7.20	2,405	79%
2012	NC	Richmond County Plant	7805	10	SRVC	none	346	7.09	2,565	84%
2012	NE	Beatrice	8000	1	MROW	SPP	144	9.01	156	12%
2012	NE	Beatrice	8000	2	MROW	SPP	142	8.98	137	11%
2012	NE	Terry Bundy Generating Station	7887	SVGS2	MROW	SPP	63	8.52	59	11%
2012	NE	Terry Bundy Generating Station	7887	SVGS3	MROW	SPP	63	8.43	57	10%

Year	State	Facility Name	Facility ID (ORISPL)	Unit ID	eGRID Sub-region	ISO / RTO	Capacity (MW)	Heat Rate (MMBtu/ MWh)	Generation (GWh)	Capacity Factor
2012	NH	EP Newington Energy, LLC	55661	1	NEWE	ISONE	340	7.30	1,077	36%
2012	NH	EP Newington Energy, LLC	55661	2	NEWE	ISONE	322	7.33	1,097	39%
2012	NH	Granite Ridge Energy	55170	1	NEWE	ISONE	270	11.12	1,532	65%
2012	NH	Granite Ridge Energy	55170	2	NEWE	ISONE	280	11.00	1,669	68%
2012	NJ	Bergen	2398	1101	RFCE	PJM	120	11.23	496	47%
2012	NJ	Bergen	2398	1201	RFCE	PJM	122	10.88	606	57%
2012	NJ	Bergen	2398	1301	RFCE	PJM	120	12.32	497	47%
2012	NJ	Bergen	2398	1401	RFCE	PJM	122	12.14	540	50%
2012	NJ	Bergen	2398	2101	RFCE	PJM	191	11.74	871	52%
2012	NJ	Bergen	2398	2201	RFCE	PJM	188	11.11	955	58%
2012	NJ	Camden Plant Holding, LLC	10751	2001	RFCE	PJM	152	8.73	537	40%
2012	NJ	E F Kenilworth, Inc.	10805	2001	RFCE	PJM	23	11.06	152	75%
2012	NJ	Eagle Point Power Generation	50561	1	RFCE	PJM	119	9.19	72	7%
2012	NJ	Eagle Point Power Generation	50561	2	RFCE	PJM	116	9.26	28	3%
2012	NJ	EFS Parlin Holdings, LLC	50799	1001	RFCE	PJM	69	9.41	79	13%

Year	State	Facility Name	Facility ID (ORISPL)	Unit ID	eGRID Sub-region	ISO / RTO	Capacity (MW)	Heat Rate (MMBtu/ MWh)	Generation (GWh)	Capacity Factor
2012	NJ	EFS Parlin Holdings, LLC	50799	3001	RFCE	PJM	69	8.64	86	14%
2012	NJ	Elmwood Park Power - LLC	50852	2001	RFCE	PJM	77	9.46	51	7%
2012	NJ	Gilbert Generating Station	2393	4	RFCE	PJM	70	14.53	9	1%
2012	NJ	Gilbert Generating Station	2393	5	RFCE	PJM	70	14.28	12	2%
2012	NJ	Gilbert Generating Station	2393	6	RFCE	PJM	70	13.96	12	2%
2012	NJ	Gilbert Generating Station	2393	7	RFCE	PJM	72	14.08	8	1%
2012	NJ	Lakewood Cogeneration	54640	1001	RFCE	PJM	94	11.95	211	26%
2012	NJ	Lakewood Cogeneration	54640	2001	RFCE	PJM	92	11.95	192	24%
2012	NJ	Linden Cogeneration Facility	50006	4001	RFCE	PJM	299	6.57	2,014	77%
2012	NJ	Linden Cogeneration Facility	50006	5001	RFCE	PJM	189	6.90	739	45%
2012	NJ	Linden Cogeneration Facility	50006	6001	RFCE	PJM	190	6.87	793	48%
2012	NJ	Linden Cogeneration Facility	50006	7001	RFCE	PJM	194	6.90	747	44%
2012	NJ	Linden Cogeneration Facility	50006	8001	RFCE	PJM	209	6.89	380	21%
2012	NJ	Linden Cogeneration Facility	50006	9001	RFCE	PJM	189	6.94	687	41%
2012	NJ	Linden Generating Station	2406	1101	RFCE	PJM	242	11.04	935	44%

Year	State	Facility Name	Facility ID (ORISPL)	Unit ID	eGRID Sub-region	ISO / RTO	Capacity (MW)	Heat Rate (MMBtu/ MWh)	Generation (GWh)	Capacity Factor
2012	NJ	Linden Generating Station	2406	1201	RFCE	PJM	236	11.03	914	44%
2012	NJ	Linden Generating Station	2406	2101	RFCE	PJM	233	10.69	853	42%
2012	NJ	Linden Generating Station	2406	2201	RFCE	PJM	235	11.01	879	43%
2012	NJ	Newark Bay Cogen	50385	1001	RFCE	PJM	80	8.56	449	64%
2012	NJ	Newark Bay Cogen	50385	2001	RFCE	PJM	80	8.70	412	59%
2012	NJ	North Jersey Energy Associates	10308	1001	RFCE	PJM	124	8.16	817	75%
2012	NJ	North Jersey Energy Associates	10308	1002	RFCE	PJM	126	8.15	829	75%
2012	NJ	Pedricktown Cogeneration Plant	10099	1001	RFCE	PJM	235	8.18	429	21%
2012	NJ	Red Oak Power, LLC	55239	1	RFCE	PJM	195	10.64	1,275	74%
2012	NJ	Red Oak Power, LLC	55239	2	RFCE	PJM	195	10.71	1,152	67%
2012	NJ	Red Oak Power, LLC	55239	3	RFCE	PJM	199	10.86	980	56%
2012	NM	Afton Generating Station	55210	1	AZNM	none	249	7.33	499	23%
2012	NM	Luna Energy Facility	55343	CTG1	AZNM	none	290	7.37	962	38%
2012	NM	Luna Energy Facility	55343	CTG2	AZNM	none	294	7.47	914	35%
2012	NM	Hobbs Generating Station	56458	HOBB1	AZNM	SPP	312	7.39	1,655	60%

Year	State	Facility Name	Facility ID (ORISPL)	Unit ID	eGRID Sub-region	ISO / RTO	Capacity (MW)	Heat Rate (MMBtu/ MWh)	Generation (GWh)	Capacity Factor
2012	NM	Hobbs Generating Station	56458	HOBB2	AZNM	SPP	343	7.57	1,362	45%
2012	NM	Bluffview Power Plant	55977	CTG-1	RMPA	none	60	8.38	436	83%
2012	NV	Apex Generating Station	55514	CTG01	AZNM	none	300	7.10	660	25%
2012	NV	Apex Generating Station	55514	CTG02	AZNM	none	272	7.15	695	29%
2012	NV	Chuck Lenzie Generating Station	55322	CTG-1	AZNM	none	296	7.01	1,583	61%
2012	NV	Chuck Lenzie Generating Station	55322	CTG-2	AZNM	none	293	7.09	1,524	59%
2012	NV	Chuck Lenzie Generating Station	55322	CTG-3	AZNM	none	306	7.14	1,729	64%
2012	NV	Chuck Lenzie Generating Station	55322	CTG-4	AZNM	none	304	7.10	1,740	65%
2012	NV	Desert Star Energy Center	55077	EDE1	AZNM	none	263	7.11	1,290	56%
2012	NV	Desert Star Energy Center	55077	EDE2	AZNM	none	257	7.08	1,249	55%
2012	NV	Harry Allen	7082	**5	AZNM	none	311	6.65	1,749	64%
2012	NV	Harry Allen	7082	**6	AZNM	none	270	6.67	1,749	74%
2012	NV	Las Vegas Cogeneration	10761	1	AZNM	none	43	9.45	40	10%
2012	NV	Las Vegas Cogeneration	10761	2	AZNM	none	47	9.84	87	21%
2012	NV	Las Vegas Cogeneration	10761	3	AZNM	none	48	9.93	90	21%

Year	State	Facility Name	Facility ID (ORISPL)	Unit ID	eGRID Sub-region	ISO / RTO	Capacity (MW)	Heat Rate (MMBtu/ MWh)	Generation (GWh)	Capacity Factor
2012	NV	Las Vegas Cogeneration	10761	4	AZNM	none	48	9.79	90	21%
2012	NV	Las Vegas Cogeneration	10761	5	AZNM	none	48	9.70	88	21%
2012	NV	Silverhawk	55841	A01	AZNM	none	181	7.46	892	56%
2012	NV	Silverhawk	55841	A03	AZNM	none	175	7.57	942	61%
2012	NV	Walter M. Higgins III Generating Station	55687	BHG1	AZNM	none	310	7.36	1,374	50%
2012	NV	Walter M. Higgins III Generating Station	55687	BHG2	AZNM	none	309	7.08	1,348	50%
2012	NV	Tracy	2336	6	NWPP	none	107	8.51	329	35%
2012	NV	Tracy	2336	8	NWPP	none	303	7.28	1,721	65%
2012	NV	Tracy	2336	9	NWPP	none	304	7.34	1,728	65%
2012	NY	Allegany Station No. 133	10619	1	NYCW	NYISO	66	8.01	84	14%
2012	NY	Astoria Energy	55375	CT1	NYCW	NYISO	313	6.55	1,719	63%
2012	NY	Astoria Energy	55375	CT2	NYCW	NYISO	313	6.49	1,967	72%
2012	NY	Astoria Energy	55375	CT3	NYCW	NYISO	319	7.16	1,680	60%
2012	NY	Astoria Energy	55375	CT4	NYCW	NYISO	317	7.05	1,659	60%
2012	NY	Brooklyn Navy Yard Cogeneration	54914	1	NYCW	NYISO	120	12.20	646	61%

Year	State	Facility Name	Facility ID (ORISPL)	Unit ID	eGRID Sub-region	ISO / RTO	Capacity (MW)	Heat Rate (MMBtu/ MWh)	Generation (GWh)	Capacity Factor
2012	NY	Brooklyn Navy Yard Cogeneration	54914	2	NYCW	NYISO	120	12.00	687	65%
2012	NY	Caithness Long Island Energy Center	56234	1	NYCW	NYISO	365	6.67	2,316	72%
2012	NY	East River	2493	1	NYCW	NYISO	277	10.68	1,232	51%
2012	NY	East River	2493	2	NYCW	NYISO	289	10.67	1,271	50%
2012	NY	Empire Generating Company LLC	56259	CT-1	NYCW	NYISO	313	7.02	2,001	73%
2012	NY	Empire Generating Company LLC	56259	CT-2	NYCW	NYISO	315	7.04	1,795	65%
2012	NY	KIAC Cogeneration	54114	GT1	NYCW	NYISO	80	9.71	344	49%
2012	NY	KIAC Cogeneration	54114	GT2	NYCW	NYISO	66	9.61	269	46%
2012	NY	Poletti 500 MW CC	56196	CTG7A	NYCW	NYISO	323	7.08	1,619	57%
2012	NY	Poletti 500 MW CC	56196	CTG7B	NYCW	NYISO	287	7.08	1,581	63%
2012	NY	Ravenswood Generating Station	2500	UCC001	NYCW	NYISO	331	4.98	1,487	51%
2012	NY	Riverbay Corp. - Co-Op City	52168	4	NYCW	NYISO	13	11.45	24	21%
2012	NY	Riverbay Corp. - Co-Op City	52168	6	NYCW	NYISO	12	11.80	13	13%
2012	NY	Bethpage Energy Center	50292	GT1	NYLI	NYISO	61	5.77	124	23%
2012	NY	Bethpage Energy Center	50292	GT2	NYLI	NYISO	61	6.08	136	25%

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2012	NY	Bethpage Energy Center	50292	GT4	NYLI	NYISO	84	7.92	218	30%
2012	NY	Nassau Energy Corporation	52056	4	NYLI	NYISO	52	11.68	343	75%
2012	NY	Nissequogue Cogen	54149	1	NYLI	NYISO	48	10.91	323	77%
2012	NY	Pinelawn Power	56188	1	NYLI	NYISO	80	8.13	336	48%
2012	NY	Richard M Flynn (Holtsville)	7314	1	NYLI	NYISO	154	12.06	817	60%
2012	NY	Athens Generating Company	55405	1	NYUP	NYISO	402	6.84	1,561	44%
2012	NY	Athens Generating Company	55405	2	NYUP	NYISO	398	6.74	2,282	65%
2012	NY	Athens Generating Company	55405	3	NYUP	NYISO	397	6.73	2,006	58%
2012	NY	Batavia Energy	54593	1	NYUP	NYISO	43	11.64	73	19%
2012	NY	Bethlehem Energy Center (Albany)	2539	10001	NYUP	NYISO	194	10.38	1,176	69%
2012	NY	Bethlehem Energy Center (Albany)	2539	10002	NYUP	NYISO	194	10.40	1,106	65%
2012	NY	Bethlehem Energy Center (Albany)	2539	10003	NYUP	NYISO	193	10.30	1,062	63%
2012	NY	Carr Street Generating Station	50978	A	NYUP	NYISO	42	10.64	26	7%
2012	NY	Carr Street Generating Station	50978	B	NYUP	NYISO	42	10.70	26	7%
2012	NY	Carthage Energy	10620	1	NYUP	NYISO	67	8.85	25	4%

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2012	NY	Castleton Power, LLC	10190	1	NYUP	NYISO	97	8.51	147	17%
2012	NY	Fortistar North Tonawanda Inc	54131	NTCT1	NYUP	NYISO	47	11.89	56	13%
2012	NY	Indeck-Corinth Energy Center	50458	1	NYUP	NYISO	135	8.04	663	56%
2012	NY	Indeck-Olean Energy Center	54076	1	NYUP	NYISO	87	8.69	135	18%
2012	NY	Indeck-Oswego Energy Center	50450	1	NYUP	NYISO	65	8.90	26	5%
2012	NY	Indeck-Silver Springs Energy Center	50449	1	NYUP	NYISO	60	8.95	68	13%
2012	NY	Indeck-Yerkes Energy Center	50451	1	NYUP	NYISO	61	9.24	56	11%
2012	NY	Independence	54547	1	NYUP	NYISO	285	7.36	1,484	59%
2012	NY	Independence	54547	2	NYUP	NYISO	276	7.37	1,475	61%
2012	NY	Independence	54547	3	NYUP	NYISO	285	7.46	1,269	51%
2012	NY	Independence	54547	4	NYUP	NYISO	272	7.48	1,245	52%
2012	NY	Lockport	54041	11854	NYUP	NYISO	50	12.64	75	17%
2012	NY	Lockport	54041	11855	NYUP	NYISO	49	11.99	56	13%
2012	NY	Lockport	54041	11856	NYUP	NYISO	51	12.15	60	13%
2012	NY	Massena Energy Facility	54592	1	NYUP	NYISO	59	14.19	4	1%

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2012	NY	Rensselaer Cogen	54034	1GTDBS	NYUP	NYISO	83	8.86	70	10%
2012	NY	S A Carlson	2682	20	NYUP	NYISO	46	10.64	186	46%
2012	NY	Saranac Power Partners, LP	54574	1	NYUP	NYISO	157	8.91	255	19%
2012	NY	Saranac Power Partners, LP	54574	2	NYUP	NYISO	158	8.89	208	15%
2012	NY	Selkirk Cogen Partners	10725	CTG101	NYUP	NYISO	147	8.29	623	48%
2012	NY	Selkirk Cogen Partners	10725	CTG201	NYUP	NYISO	150	8.15	573	44%
2012	NY	Selkirk Cogen Partners	10725	CTG301	NYUP	NYISO	144	8.21	573	45%
2012	NY	Sterling Power Plant	50744	1	NYUP	NYISO	45	11.57	27	7%
2012	NY	WPS Beaver Falls Generation, LLC	10617	1	NYUP	NYISO	98	12.43	5	1%
2012	NY	WPS Syracuse Generation, LLC	10621	1	NYUP	NYISO	100	11.58	12	1%
2012	OH	Duke Energy Hanging Rock, II LLC	55736	CTG1	RFCW	PJM	345	7.06	2,200	73%
2012	OH	Duke Energy Hanging Rock, II LLC	55736	CTG2	RFCW	PJM	338	7.11	2,200	74%
2012	OH	Duke Energy Hanging Rock, II LLC	55736	CTG3	RFCW	PJM	344	7.19	2,194	73%
2012	OH	Duke Energy Hanging Rock, II LLC	55736	CTG4	RFCW	PJM	346	7.12	2,183	72%
2012	OH	Duke Energy Washington, II LLC	55397	CT1	RFCW	PJM	334	7.17	2,205	75%

Year	State	Facility Name	Facility ID (ORISPL)	Unit ID	eGRID Sub-region	ISO / RTO	Capacity (MW)	Heat Rate (MMBtu/ MWh)	Generation (GWh)	Capacity Factor
2012	OH	Duke Energy Washington, II LLC	55397	CT2	RFCW	PJM	334	7.06	2,193	75%
2012	OH	Waterford Plant	55503	1	RFCW	PJM	292	6.98	1,724	67%
2012	OH	Waterford Plant	55503	2	RFCW	PJM	295	7.02	1,703	66%
2012	OH	Waterford Plant	55503	3	RFCW	PJM	287	7.10	1,740	69%
2012	OK	Tenaska Kiamichi Generating Station	55501	CTGDB1	SPSO	ERCOT	350	6.49	1,142	37%
2012	OK	Tenaska Kiamichi Generating Station	55501	CTGDB2	SPSO	ERCOT	347	6.90	1,181	39%
2012	OK	Comanche (8059)	8059	7251	SPSO	SPP	85	14.02	421	56%
2012	OK	Comanche (8059)	8059	7252	SPSO	SPP	87	14.28	196	26%
2012	OK	Green Country Energy, LLC	55146	CTGEN1	SPSO	SPP	300	7.13	1,201	46%
2012	OK	Horseshoe Lake	2951	7	SPSO	SPP	258	11.20	343	15%
2012	OK	McClain Energy Facility	55457	CT1	SPSO	SPP	183	10.50	1,214	76%
2012	OK	McClain Energy Facility	55457	CT2	SPSO	SPP	182	10.47	1,270	79%
2012	OK	Northeastern	2963	3301A	SPSO	SPP	183	11.75	643	40%
2012	OK	Northeastern	2963	3301B	SPSO	SPP	178	11.95	674	43%
2012	OK	Oneta Energy Center	55225	CTG-1	SPSO	SPP	393	7.43	974	28%

Year	State	Facility Name	Facility ID (ORISPL)	Unit ID	eGRID Sub-region	ISO / RTO	Capacity (MW)	Heat Rate (MMBtu/ MWh)	Generation (GWh)	Capacity Factor
2012	OK	Oneta Energy Center	55225	CTG-2	SPSO	SPP	338	7.30	866	29%
2012	OK	Oneta Energy Center	55225	CTG-3	SPSO	SPP	387	7.29	791	23%
2012	OK	Oneta Energy Center	55225	CTG-4	SPSO	SPP	343	7.37	815	27%
2012	OK	Ponca	762	3	SPSO	SPP	60	8.80	48	9%
2012	OK	Redbud Power Plant	55463	CT-01	SPSO	SPP	335	7.46	1,706	58%
2012	OK	Redbud Power Plant	55463	CT-02	SPSO	SPP	334	7.45	1,778	61%
2012	OK	Redbud Power Plant	55463	CT-03	SPSO	SPP	338	7.43	1,922	65%
2012	OK	Redbud Power Plant	55463	CT-04	SPSO	SPP	333	7.43	1,279	44%
2012	OK	Chouteau Power Plant	7757	1	SRMW	SPP	260	7.35	870	38%
2012	OK	Chouteau Power Plant	7757	2	SRMW	SPP	261	7.23	858	37%
2012	OK	Chouteau Power Plant	7757	3	SRMW	SPP	271	7.03	746	31%
2012	OK	Chouteau Power Plant	7757	4	SRMW	SPP	271	7.19	827	35%
2012	OR	Coyote Springs	7350	CTG1	NWPP	none	185	9.60	859	53%
2012	OR	Coyote Springs	7350	CTG2	NWPP	none	309	6.89	1,154	43%
2012	OR	Hermiston Power Plant	55328	CTG-1	NWPP	none	323	7.00	1,514	53%

Year	State	Facility Name	Facility ID (ORISPL)	Unit ID	eGRID Sub-region	ISO / RTO	Capacity (MW)	Heat Rate (MMBtu/ MWh)	Generation (GWh)	Capacity Factor
2012	OR	Hermiston Power Plant	55328	CTG-2	NWPP	none	357	6.97	1,454	46%
2012	OR	Klamath Cogeneration Project	55103	CT1	NWPP	none	357	7.22	1,074	34%
2012	OR	Klamath Cogeneration Project	55103	CT2	NWPP	none	331	7.34	1,195	41%
2012	OR	Port Westward	56227	PWEU1	NWPP	none	441	6.81	1,769	46%
2012	PA	North East Cogeneration Plant	54571	1	NYUP	NYISO	40		0	0%
2012	PA	North East Cogeneration Plant	54571	2	NYUP	NYISO	44		0	0%
2012	PA	Fairless Energy, LLC	55298	1A	RFCE	PJM	343	6.96	2,104	70%
2012	PA	Fairless Energy, LLC	55298	1B	RFCE	PJM	338	6.79	2,233	75%
2012	PA	Fairless Energy, LLC	55298	2A	RFCE	PJM	326	6.90	2,082	73%
2012	PA	Fairless Energy, LLC	55298	2B	RFCE	PJM	322	7.02	2,110	75%
2012	PA	FPL Energy Marcus Hook, LP	55801	1	RFCE	PJM	191	10.68	1,108	66%
2012	PA	FPL Energy Marcus Hook, LP	55801	2	RFCE	PJM	193	10.81	1,046	62%
2012	PA	FPL Energy Marcus Hook, LP	55801	3	RFCE	PJM	192	10.68	1,006	60%
2012	PA	FPL Energy MH50	50074	1	RFCE	PJM	58	13.94	0	0%
2012	PA	Grays Ferry Cogen Partnership	54785	2	RFCE	PJM	134	12.19	665	56%

Year	State	Facility Name	Facility ID (ORISPL)	Unit ID	eGRID Sub-region	ISO / RTO	Capacity (MW)	Heat Rate (MMBtu/ MWh)	Generation (GWh)	Capacity Factor
2012	PA	Hunlock Creek Energy Center	3176	CT5	RFCE	PJM	63	7.88	233	42%
2012	PA	Hunterstown Combined Cycle	55976	CT101	RFCE	PJM	198	10.76	1,018	59%
2012	PA	Hunterstown Combined Cycle	55976	CT201	RFCE	PJM	195	10.73	866	51%
2012	PA	Hunterstown Combined Cycle	55976	CT301	RFCE	PJM	199	10.73	1,032	59%
2012	PA	Liberty Electric Power Plant	55231	1	RFCE	PJM	225	10.26	1,335	68%
2012	PA	Liberty Electric Power Plant	55231	2	RFCE	PJM	223	10.20	1,347	69%
2012	PA	Lower Mount Bethel Energy	55667	CT01	RFCE	PJM	321	7.01	1,555	55%
2012	PA	Lower Mount Bethel Energy	55667	CT02	RFCE	PJM	321	6.94	1,904	68%
2012	PA	Ontelaunee Energy Center	55193	CT1	RFCE	PJM	318	6.80	1,797	64%
2012	PA	Ontelaunee Energy Center	55193	CT2	RFCE	PJM	324	6.76	1,841	65%
2012	PA	PPL Ironwood, LLC	55337	1	RFCE	PJM	270	11.20	1,329	56%
2012	PA	PPL Ironwood, LLC	55337	2	RFCE	PJM	265	11.28	1,633	70%
2012	PA	Allegheny Energy Units 3, 4 & 5	55710	3	RFCW	PJM	200	10.58	1,092	62%
2012	PA	Allegheny Energy Units 3, 4 & 5	55710	4	RFCW	PJM	200	10.32	995	57%
2012	PA	Bethlehem Power Plant	55690	1	RFCW	PJM	192	7.73	993	59%

Year	State	Facility Name	Facility ID (ORISPL)	Unit ID	eGRID Sub-region	ISO / RTO	Capacity (MW)	Heat Rate (MMBtu/ MWh)	Generation (GWh)	Capacity Factor
2012	PA	Bethlehem Power Plant	55690	2	RFCW	PJM	192	7.82	990	59%
2012	PA	Bethlehem Power Plant	55690	3	RFCW	PJM	192	7.85	998	59%
2012	PA	Bethlehem Power Plant	55690	5	RFCW	PJM	192	7.85	991	59%
2012	PA	Bethlehem Power Plant	55690	6	RFCW	PJM	193	7.96	1,003	59%
2012	PA	Bethlehem Power Plant	55690	7	RFCW	PJM	193	7.94	1,006	59%
2012	PA	Brunot Island Power Station	3096	3	RFCW	PJM	66	14.74	7	1%
2012	PA	Brunot Island Power Station	3096	2A	RFCW	PJM	68	17.12	5	1%
2012	PA	Brunot Island Power Station	3096	2B	RFCW	PJM	66	15.79	9	2%
2012	PA	Duke Energy Fayette, II LLC	55516	CTG1	RFCW	PJM	345	7.14	2,204	73%
2012	PA	Duke Energy Fayette, II LLC	55516	CTG2	RFCW	PJM	342	7.18	2,222	74%
2012	RI	Entergy Rhode Island State Energy LP	55107	RISEP1	NEWE	ISONE	310	6.83	1,262	46%
2012	RI	Manchester Street	3236	9	NEWE	ISONE	121	12.56	539	51%
2012	RI	Manchester Street	3236	10	NEWE	ISONE	121	12.00	625	59%
2012	RI	Manchester Street	3236	11	NEWE	ISONE	121	11.98	580	55%
2012	RI	Ocean State Power	51030	1	NEWE	ISONE	102	11.95	297	33%

Year	State	Facility Name	Facility ID (ORISPL)	Unit ID	eGRID Sub-region	ISO / RTO	Capacity (MW)	Heat Rate (MMBtu/ MWh)	Generation (GWh)	Capacity Factor
2012	RI	Ocean State Power	51030	2	NEWE	ISONE	105	12.38	290	31%
2012	RI	Ocean State Power II	54324	3	NEWE	ISONE	102	12.79	229	26%
2012	RI	Ocean State Power II	54324	4	NEWE	ISONE	102	12.74	236	26%
2012	RI	Pawtucket Power Associates, LP	54056	1	NEWE	ISONE	69	8.83	7	1%
2012	RI	Tiverton Power, LLC	55048	1	NEWE	ISONE	277	7.09	1,650	68%
2012	SC	Cherokee County Cogen	55043	CCCP1	SRVC	none	73	12.30	464	72%
2012	SC	Columbia Energy Center (SC)	55386	CT-1	SRVC	none	308	6.54	39	1%
2012	SC	Columbia Energy Center (SC)	55386	CT-2	SRVC	none	312	6.51	24	1%
2012	SC	Jasper County Generating Facility	55927	CT01	SRVC	none	242	10.10	1,090	51%
2012	SC	Jasper County Generating Facility	55927	CT02	SRVC	none	231	9.71	1,131	56%
2012	SC	Jasper County Generating Facility	55927	CT03	SRVC	none	228	9.78	1,070	53%
2012	SC	John S. Rainey Generating Station	7834	CT1A	SRVC	none	178	10.88	1,089	70%
2012	SC	John S. Rainey Generating Station	7834	CT1B	SRVC	none	180	10.85	1,091	69%
2012	SC	Urquhart	3295	URQ5	SRVC	none	185	11.02	781	48%
2012	SC	Urquhart	3295	URQ6	SRVC	none	182	10.91	833	52%

Year	State	Facility Name	Facility ID (ORISPL)	Unit ID	eGRID Sub-region	ISO / RTO	Capacity (MW)	Heat Rate (MMBtu/ MWh)	Generation (GWh)	Capacity Factor
2012	TN	Lagoon Creek	7845	LCC1	SRTV	none	312	6.10	1,675	61%
2012	TN	Lagoon Creek	7845	LCC2	SRTV	none	309	6.52	1,507	56%
2012	TX	Newman	3456	**4	AZNM	none	78	14.68	356	52%
2012	TX	Newman	3456	**5	AZNM	none	76	14.70	205	31%
2012	TX	Newman	3456	GT-6A	AZNM	none	76	6.99	806	121%
2012	TX	Newman	3456	GT-6B	AZNM	none	73	16.13	307	48%
2012	TX	Bastrop Clean Energy Center	55168	CTG-1A	ERCT	ERCOT	310	7.51	1,550	57%
2012	TX	Bayou Cogeneration Plant	10298	CG802	ERCT	ERCOT	85	14.30	530	71%
2012	TX	Bayou Cogeneration Plant	10298	CG803	ERCT	ERCOT	85	15.14	456	61%
2012	TX	Bayou Cogeneration Plant	10298	CG804	ERCT	ERCOT	85	15.05	453	61%
2012	TX	Baytown Energy Center	55327	CTG-1	ERCT	ERCOT	271	7.83	1,532	64%
2012	TX	Baytown Energy Center	55327	CTG-2	ERCT	ERCOT	265	7.99	1,324	57%
2012	TX	Baytown Energy Center	55327	CTG-3	ERCT	ERCOT	263	7.69	1,558	67%
2012	TX	Bosque County Power Plant	55172	GT-1	ERCT	ERCOT	180	11.37	471	30%
2012	TX	Bosque County Power Plant	55172	GT-2	ERCT	ERCOT	180	11.28	468	30%

Year	State	Facility Name	Facility ID (ORISPL)	Unit ID	eGRID Sub-region	ISO / RTO	Capacity (MW)	Heat Rate (MMBtu/ MWh)	Generation (GWh)	Capacity Factor
2012	TX	Bosque County Power Plant	55172	GT-3	ERCT	ERCOT	178	11.38	438	28%
2012	TX	Brazos Valley Energy, LP	55357	CTG1	ERCT	ERCOT	318	7.09	1,735	62%
2012	TX	Brazos Valley Energy, LP	55357	CTG2	ERCT	ERCOT	327	7.07	1,735	60%
2012	TX	C. R. Wing Cogeneration Plant	52176	1	ERCT	ERCOT	113	9.10	115	12%
2012	TX	C. R. Wing Cogeneration Plant	52176	2	ERCT	ERCOT	114	9.13	123	12%
2012	TX	Calpine Hidalgo Energy Center	7762	HRSG1	ERCT	ERCOT	257	7.07	1,395	62%
2012	TX	Calpine Hidalgo Energy Center	7762	HRSG2	ERCT	ERCOT	271	7.06	1,358	57%
2012	TX	Cedar Bayou 4	56806	CBY41	ERCT	ERCOT	200	10.92	601	34%
2012	TX	Cedar Bayou 4	56806	CBY42	ERCT	ERCOT	201	11.02	575	33%
2012	TX	Channelview Cogeneration Facility	55187	CHV1	ERCT	ERCOT	322	6.84	1,978	70%
2012	TX	Channelview Cogeneration Facility	55187	CHV2	ERCT	ERCOT	325	6.81	1,833	64%
2012	TX	Channelview Cogeneration Facility	55187	CHV3	ERCT	ERCOT	313	6.90	2,003	73%
2012	TX	Channelview Cogeneration Facility	55187	CHV4	ERCT	ERCOT	321	6.80	2,052	73%
2012	TX	Clear Lake Cogeneration	10741	G102	ERCT	ERCOT	115	10.11	182	18%
2012	TX	Clear Lake Cogeneration	10741	G103	ERCT	ERCOT	125	9.35	136	12%

Year	State	Facility Name	Facility ID (ORISPL)	Unit ID	eGRID Sub-region	ISO / RTO	Capacity (MW)	Heat Rate (MMBtu/ MWh)	Generation (GWh)	Capacity Factor
2012	TX	Clear Lake Cogeneration	10741	G104	ERCT	ERCOT	116	10.49	208	20%
2012	TX	Colorado Bend Energy Center	56350	CT1A	ERCT	ERCOT	172	8.24	353	23%
2012	TX	Colorado Bend Energy Center	56350	CT1B	ERCT	ERCOT	139	8.16	333	27%
2012	TX	Colorado Bend Energy Center	56350	CT2A	ERCT	ERCOT	142	4.73	890	71%
2012	TX	Colorado Bend Energy Center	56350	CT2B	ERCT	ERCOT	140	8.13	508	41%
2012	TX	Corpus Christi Energy Center	55206	CU1	ERCT	ERCOT	324	8.35	1,591	56%
2012	TX	Corpus Christi Energy Center	55206	CU2	ERCT	ERCOT	334	8.33	1,281	44%
2012	TX	Deer Park Energy Center	55464	CTG1	ERCT	ERCOT	388	6.43	2,230	65%
2012	TX	Deer Park Energy Center	55464	CTG2	ERCT	ERCOT	400	6.45	2,628	75%
2012	TX	Deer Park Energy Center	55464	CTG3	ERCT	ERCOT	386	6.51	2,454	72%
2012	TX	Deer Park Energy Center	55464	CTG4	ERCT	ERCOT	388	6.44	2,378	70%
2012	TX	Ennis Power Company, LLC	55223	GT-1	ERCT	ERCOT	374	6.71	2,026	62%
2012	TX	FPLE Forney, LP	55480	U1	ERCT	ERCOT	234	10.63	1,055	51%
2012	TX	FPLE Forney, LP	55480	U2	ERCT	ERCOT	223	10.66	1,074	55%
2012	TX	FPLE Forney, LP	55480	U3	ERCT	ERCOT	225	10.74	1,040	53%

Year	State	Facility Name	Facility ID (ORISPL)	Unit ID	eGRID Sub-region	ISO / RTO	Capacity (MW)	Heat Rate (MMBtu/ MWh)	Generation (GWh)	Capacity Factor
2012	TX	FPLE Forney, LP	55480	U4	ERCT	ERCOT	224	10.76	1,069	54%
2012	TX	FPLE Forney, LP	55480	U5	ERCT	ERCOT	224	10.52	1,086	55%
2012	TX	FPLE Forney, LP	55480	U6	ERCT	ERCOT	230	10.74	1,112	55%
2012	TX	Freestone Power Generation	55226	GT1	ERCT	ERCOT	270	6.95	1,393	59%
2012	TX	Freestone Power Generation	55226	GT2	ERCT	ERCOT	276	6.94	1,468	61%
2012	TX	Freestone Power Generation	55226	GT3	ERCT	ERCOT	274	7.08	1,330	55%
2012	TX	Freestone Power Generation	55226	GT4	ERCT	ERCOT	277	7.09	1,257	52%
2012	TX	Frontera Generation Facility	55098	1	ERCT	ERCOT	252	7.40	1,561	71%
2012	TX	Frontera Generation Facility	55098	2	ERCT	ERCOT	265	7.38	1,518	65%
2012	TX	Gregory Power Facility	55086	101	ERCT	ERCOT	327	7.17	1,975	69%
2012	TX	Gregory Power Facility	55086	102	ERCT	ERCOT	326	7.15	2,230	78%
2012	TX	Guadalupe Generating Station	55153	CTG-1	ERCT	ERCOT	170	11.06	340	23%
2012	TX	Guadalupe Generating Station	55153	CTG-2	ERCT	ERCOT	170	11.05	373	25%
2012	TX	Guadalupe Generating Station	55153	CTG-3	ERCT	ERCOT	164	11.02	392	27%
2012	TX	Guadalupe Generating Station	55153	CTG-4	ERCT	ERCOT	169	11.14	418	28%

Year	State	Facility Name	Facility ID (ORISPL)	Unit ID	eGRID Sub-region	ISO / RTO	Capacity (MW)	Heat Rate (MMBtu/ MWh)	Generation (GWh)	Capacity Factor
2012	TX	Hays Energy Project	55144	STK1	ERCT	ERCOT	249	7.33	475	22%
2012	TX	Hays Energy Project	55144	STK2	ERCT	ERCOT	248	7.24	361	17%
2012	TX	Hays Energy Project	55144	STK3	ERCT	ERCOT	255	7.12	458	20%
2012	TX	Hays Energy Project	55144	STK4	ERCT	ERCOT	258	7.14	672	30%
2012	TX	Jack County Generation Facility	55230	CT-1	ERCT	ERCOT	337	6.84	1,304	44%
2012	TX	Jack County Generation Facility	55230	CT-2	ERCT	ERCOT	334	6.88	1,275	43%
2012	TX	Jack County Generation Facility	55230	CT-3	ERCT	ERCOT	350	6.74	1,615	53%
2012	TX	Jack County Generation Facility	55230	CT-4	ERCT	ERCOT	330	6.65	1,546	53%
2012	TX	Johnson County Generation Facility	54817	EAST	ERCT	ERCOT	291	7.86	912	36%
2012	TX	Lamar Power (Paris)	55097	1	ERCT	ERCOT	299	8.10	1,085	41%
2012	TX	Lamar Power (Paris)	55097	2	ERCT	ERCOT	305	8.03	1,027	38%
2012	TX	Lamar Power (Paris)	55097	3	ERCT	ERCOT	306	7.77	1,188	44%
2012	TX	Lamar Power (Paris)	55097	4	ERCT	ERCOT	301	7.99	1,273	48%
2012	TX	Lost Pines 1	55154	1	ERCT	ERCOT	183	10.78	1,195	74%
2012	TX	Lost Pines 1	55154	2	ERCT	ERCOT	182	11.26	1,172	73%

Year	State	Facility Name	Facility ID (ORISPL)	Unit ID	eGRID Sub-region	ISO / RTO	Capacity (MW)	Heat Rate (MMBtu/ MWh)	Generation (GWh)	Capacity Factor
2012	TX	Magic Valley Generating Station	55123	CTG-1	ERCT	ERCOT	678	6.65	2,157	36%
2012	TX	Magic Valley Generating Station	55123	CTG-2	ERCT	ERCOT	636	6.67	2,457	44%
2012	TX	Midlothian Energy	55091	STK1	ERCT	ERCOT	248	7.47	951	44%
2012	TX	Midlothian Energy	55091	STK2	ERCT	ERCOT	244	7.49	1,036	48%
2012	TX	Midlothian Energy	55091	STK3	ERCT	ERCOT	243	7.27	885	41%
2012	TX	Midlothian Energy	55091	STK4	ERCT	ERCOT	244	7.44	840	39%
2012	TX	Midlothian Energy	55091	STK5	ERCT	ERCOT	265	7.65	533	23%
2012	TX	Midlothian Energy	55091	STK6	ERCT	ERCOT	268	7.46	815	35%
2012	TX	Odessa-Ector Power Partners, LP	55215	GT1	ERCT	ERCOT	210	11.75	653	35%
2012	TX	Odessa-Ector Power Partners, LP	55215	GT2	ERCT	ERCOT	216	12.22	703	37%
2012	TX	Odessa-Ector Power Partners, LP	55215	GT3	ERCT	ERCOT	210	11.99	567	31%
2012	TX	Odessa-Ector Power Partners, LP	55215	GT4	ERCT	ERCOT	210	11.87	529	29%
2012	TX	Optim Energy Altura Cogen, LLC	50815	ENG101	ERCT	ERCOT	107	11.93	480	51%
2012	TX	Optim Energy Altura Cogen, LLC	50815	ENG201	ERCT	ERCOT	105	11.83	492	53%
2012	TX	Optim Energy Altura Cogen, LLC	50815	ENG301	ERCT	ERCOT	115	11.74	455	45%

Year	State	Facility Name	Facility ID (ORISPL)	Unit ID	eGRID Sub-region	ISO / RTO	Capacity (MW)	Heat Rate (MMBtu/ MWh)	Generation (GWh)	Capacity Factor
2012	TX	Optim Energy Altura Cogen, LLC	50815	ENG401	ERCT	ERCOT	106	11.64	455	49%
2012	TX	Optim Energy Altura Cogen, LLC	50815	ENG501	ERCT	ERCOT	107	11.89	383	41%
2012	TX	Optim Energy Altura Cogen, LLC	50815	ENG601	ERCT	ERCOT	105	11.28	574	62%
2012	TX	Paris Energy Center	50109	HRSG1	ERCT	ERCOT	161	9.16	207	15%
2012	TX	Paris Energy Center	50109	HRSG2	ERCT	ERCOT	132	8.90	205	18%
2012	TX	Pasadena Power Plant	55047	CG-1	ERCT	ERCOT	269	6.87	1,852	78%
2012	TX	Pasadena Power Plant	55047	CG-2	ERCT	ERCOT	325	5.73	1,795	63%
2012	TX	Pasadena Power Plant	55047	CG-3	ERCT	ERCOT	325	5.80	1,617	57%
2012	TX	Quail Run Energy Center	56349	CT1A	ERCT	ERCOT	133	9.38	115	10%
2012	TX	Quail Run Energy Center	56349	CT1B	ERCT	ERCOT	138	8.70	110	9%
2012	TX	Quail Run Energy Center	56349	CT2A	ERCT	ERCOT	140	9.61	113	9%
2012	TX	Quail Run Energy Center	56349	CT2B	ERCT	ERCOT	132	9.66	104	9%
2012	TX	Rio Nogales Power Project, LP	55137	CTG-1	ERCT	ERCOT	302	6.80	923	35%
2012	TX	Rio Nogales Power Project, LP	55137	CTG-2	ERCT	ERCOT	307	6.84	1,096	41%
2012	TX	Rio Nogales Power Project, LP	55137	CTG-3	ERCT	ERCOT	305	6.75	989	37%

Year	State	Facility Name	Facility ID (ORISPL)	Unit ID	eGRID Sub-region	ISO / RTO	Capacity (MW)	Heat Rate (MMBtu/ MWh)	Generation (GWh)	Capacity Factor
2012	TX	San Jacinto Steam Electric Station	7325	SJS1	ERCT	ERCOT	96	14.17	395	47%
2012	TX	San Jacinto Steam Electric Station	7325	SJS2	ERCT	ERCOT	98	14.20	502	58%
2012	TX	Sand Hill Energy Center	7900	SH5	ERCT	ERCOT	345	7.51	1,365	45%
2012	TX	Silas Ray	3559	9	ERCT	ERCOT	49	14.04	42	10%
2012	TX	Sweetwater Generating Plant	50615	GT01	ERCT	ERCOT	50		0	0%
2012	TX	Sweetwater Generating Plant	50615	GT02	ERCT	ERCOT	109		0	0%
2012	TX	Sweetwater Generating Plant	50615	GT03	ERCT	ERCOT	114		0	0%
2012	TX	T H Wharton	3469	THW31	ERCT	ERCOT	73	14.19	48	8%
2012	TX	T H Wharton	3469	THW32	ERCT	ERCOT	71	13.94	43	7%
2012	TX	T H Wharton	3469	THW33	ERCT	ERCOT	72	13.99	44	7%
2012	TX	T H Wharton	3469	THW34	ERCT	ERCOT	72	14.21	30	5%
2012	TX	T H Wharton	3469	THW41	ERCT	ERCOT	70	14.14	53	9%
2012	TX	T H Wharton	3469	THW42	ERCT	ERCOT	70	14.02	37	6%
2012	TX	T H Wharton	3469	THW43	ERCT	ERCOT	71	14.05	56	9%
2012	TX	T H Wharton	3469	THW44	ERCT	ERCOT	70	13.80	56	9%

Year	State	Facility Name	Facility ID (ORISPL)	Unit ID	eGRID Sub-region	ISO / RTO	Capacity (MW)	Heat Rate (MMBtu/ MWh)	Generation (GWh)	Capacity Factor
2012	TX	Texas City Cogeneration	52088	GT-A	ERCT	ERCOT	157	10.65	201	15%
2012	TX	Texas City Cogeneration	52088	GT-B	ERCT	ERCOT	155	12.71	733	54%
2012	TX	Texas City Cogeneration	52088	GT-C	ERCT	ERCOT	151	11.33	356	27%
2012	TX	V H Braunig	3612	CT01	ERCT	ERCOT	313	11.28	580	21%
2012	TX	V H Braunig	3612	CT02	ERCT	ERCOT	288	11.29	602	24%
2012	TX	Wise County Power Company, LLC	55320	GT-1	ERCT	ERCOT	406	7.18	2,087	59%
2012	TX	Wise County Power Company, LLC	55320	GT-2	ERCT	ERCOT	385	7.14	2,054	61%
2012	TX	Wolf Hollow I, LP	55139	CTG1	ERCT	ERCOT	380	11.91	815	24%
2012	TX	Wolf Hollow I, LP	55139	CTG2	ERCT	ERCOT	381	11.82	931	28%
2012	TX	Barney M. Davis	4939	3	ERCT	none	349	7.79	1,253	41%
2012	TX	Barney M. Davis	4939	4	ERCT	none	349	7.54	1,221	40%
2012	TX	Victoria Power Station	3443	9	ERCT	none	300	7.75	721	27%
2012	TX	Harrison County Power Project	55664	GT-1	SPSO	ERCOT	286	7.25	349	14%
2012	TX	Harrison County Power Project	55664	GT-2	SPSO	ERCOT	291	7.50	359	14%
2012	TX	Tenaska Gateway Generating Station	55132	OGTDB1	SPSO	ERCOT	320	7.08	1,622	58%

Year	State	Facility Name	Facility ID (ORISPL)	Unit ID	eGRID Sub-region	ISO / RTO	Capacity (MW)	Heat Rate (MMBtu/ MWh)	Generation (GWh)	Capacity Factor
2012	TX	Blackhawk Station	55064	1	SPSO	SPP	158	10.22	879	63%
2012	TX	Blackhawk Station	55064	2	SPSO	SPP	167	10.30	1,030	70%
2012	TX	Eastman Cogeneration Facility	55176	1	SPSO	SPP	235	9.79	1,221	59%
2012	TX	Eastman Cogeneration Facility	55176	2	SPSO	SPP	242	9.03	917	43%
2012	TX	J Robert Massengale Generating Station	3604	GT1	SPSO	SPP	60	8.41	145	28%
2012	TX	Mustang Station	55065	1	SPSO	SPP	394	7.47	1,410	41%
2012	TX	Mustang Station	55065	2	SPSO	SPP	398	7.56	1,261	36%
2012	TX	Cottonwood Energy Project	55358	CT1	SRMV	none	331	7.70	1,744	60%
2012	TX	Cottonwood Energy Project	55358	CT2	SRMV	none	323	7.71	1,689	60%
2012	TX	Cottonwood Energy Project	55358	CT3	SRMV	none	342	7.69	1,619	54%
2012	TX	Cottonwood Energy Project	55358	CT4	SRMV	none	339	7.62	1,746	59%
2012	TX	Exxonmobil Beaumont Refinery	50625	61STK1	SRMV	none	700	6.91	1,846	30%
2012	TX	Sabine Cogeneration Facility	55104	SAB-1	SRMV	none	41	12.55	331	92%
2012	TX	Sabine Cogeneration Facility	55104	SAB-2	SRMV	none	40	12.52	332	94%
2012	TX	SRW Cogen Limited Partnership	55120	CTG-1	SRMV	none	270	7.75	1,709	72%

Year	State	Facility Name	Facility ID (ORISPL)	Unit ID	eGRID Sub-region	ISO / RTO	Capacity (MW)	Heat Rate (MMBtu/ MWh)	Generation (GWh)	Capacity Factor
2012	TX	SRW Cogen Limited Partnership	55120	CTG-2	SRMV	none	264	7.99	1,697	73%
2012	TX	Tenaska Frontier Generating Station	55062	1	SRMV	SPP	313	7.39	1,650	60%
2012	TX	Tenaska Frontier Generating Station	55062	2	SRMV	SPP	312	7.26	1,733	63%
2012	TX	Tenaska Frontier Generating Station	55062	3	SRMV	SPP	312	7.33	1,671	61%
2012	UT	Currant Creek Power Project	56102	CTG1A	NWPP	none	295	7.35	1,172	45%
2012	UT	Currant Creek Power Project	56102	CTG1B	NWPP	none	295	7.22	1,019	39%
2012	UT	Lake Side Power Plant	56237	CT01	NWPP	none	307	7.07	1,474	55%
2012	UT	Lake Side Power Plant	56237	CT02	NWPP	none	308	7.20	1,496	55%
2012	UT	Nebo Power Station	56177	U1	NWPP	none	151	7.65	441	33%
2012	VA	Tenaska Virginia Generating Station	55439	CTGDB1	RFCW	PJM	323	7.19	1,815	64%
2012	VA	Tenaska Virginia Generating Station	55439	CTGDB2	RFCW	PJM	321	7.12	1,772	63%
2012	VA	Bellemeade Power Station	50966	1	SRVC	PJM	138	8.58	604	50%
2012	VA	Bellemeade Power Station	50966	2	SRVC	PJM	136	8.63	605	51%
2012	VA	Chesterfield Power Station	3797	7	SRVC	PJM	245	7.18	1,504	70%
2012	VA	Chesterfield Power Station	3797	**8A	SRVC	PJM	246	7.26	1,317	61%

Year	State	Facility Name	Facility ID (ORISPL)	Unit ID	eGRID Sub-region	ISO / RTO	Capacity (MW)	Heat Rate (MMBtu/ MWh)	Generation (GWh)	Capacity Factor
2012	VA	Doswell Limited Partnership	52019	501	SRVC	PJM	190	8.47	916	55%
2012	VA	Doswell Limited Partnership	52019	502	SRVC	PJM	199	8.38	821	47%
2012	VA	Doswell Limited Partnership	52019	601	SRVC	PJM	192	8.21	867	51%
2012	VA	Doswell Limited Partnership	52019	602	SRVC	PJM	196	8.21	811	47%
2012	VA	Gordonsville Power Station	54844	1	SRVC	PJM	134	8.42	679	58%
2012	VA	Gordonsville Power Station	54844	2	SRVC	PJM	133	8.61	639	55%
2012	VA	Hopewell Cogeneration Facility	10633	1	SRVC	PJM	103	11.54	335	37%
2012	VA	Hopewell Cogeneration Facility	10633	2	SRVC	PJM	104	11.43	330	36%
2012	VA	Hopewell Cogeneration Facility	10633	3	SRVC	PJM	103	11.40	341	38%
2012	VA	Possum Point Power Station	3804	6A	SRVC	PJM	319	7.08	2,000	71%
2012	VA	Possum Point Power Station	3804	6B	SRVC	PJM	326	6.99	2,024	71%
2012	WA	Centralia	3845	30	NWPP	none	51		0	0%
2012	WA	Centralia	3845	40	NWPP	none	50		0	0%
2012	WA	Centralia	3845	50	NWPP	none	51		0	0%
2012	WA	Centralia	3845	60	NWPP	none	50		0	0%

Year	State	Facility Name	Facility ID (ORISPL)	Unit ID	eGRID Sub-region	ISO / RTO	Capacity (MW)	Heat Rate (MMBtu/ MWh)	Generation (GWh)	Capacity Factor
2012	WA	Chehalis Generation Facility	55662	CT1	NWPP	none	315	7.50	436	16%
2012	WA	Chehalis Generation Facility	55662	CT2	NWPP	none	276	7.74	465	19%
2012	WA	Encogen Generating Station	7870	CT1	NWPP	none	45	11.69	29	7%
2012	WA	Encogen Generating Station	7870	CT2	NWPP	none	45	11.97	26	7%
2012	WA	Encogen Generating Station	7870	CT3	NWPP	none	44	11.98	26	7%
2012	WA	Frederickson Power LP	55818	F1CT	NWPP	none	260	7.20	358	16%
2012	WA	Goldendale Generating Station	55482	CT-1	NWPP	none	295	6.66	905	35%
2012	WA	Grays Harbor Energy Center	7999	1	NWPP	none	337	6.93	75	3%
2012	WA	Grays Harbor Energy Center	7999	2	NWPP	none	378	6.93	86	3%
2012	WA	Mint Farm Generating Station	55700	CTG1	NWPP	none	313	7.10	1,133	41%
2012	WA	River Road	7605	1	NWPP	none	266	7.01	864	37%
2012	WA	Sumas Generating Station	54476	CT-1	NWPP	none	100	12.40	159	18%
2012	WI	Riverside Energy Center	55641	CT-01	MROE	MISO	326	6.60	678	24%
2012	WI	Riverside Energy Center	55641	CT-02	MROE	MISO	328	6.64	550	19%
2012	WI	Fox Energy Company LLC	56031	CTG-1	RFCW	MISO	346	6.18	1,543	51%

Year	State	Facility Name	Facility ID (ORISPL)	Unit ID	eGRID Sub-region	ISO / RTO	Capacity (MW)	Heat Rate (MMBtu/ MWh)	Generation (GWh)	Capacity Factor
2012	WI	Fox Energy Company LLC	56031	CTG-2	RFCW	MISO	333	7.20	1,229	42%
2012	WI	Port Washington Generating Station	4040	11	RFCW	MISO	308	7.03	1,322	49%
2012	WI	Port Washington Generating Station	4040	12	RFCW	MISO	306	7.03	1,282	48%
2012	WI	Port Washington Generating Station	4040	21	RFCW	MISO	307	6.97	1,215	45%
2012	WI	Port Washington Generating Station	4040	22	RFCW	MISO	309	6.94	1,255	46%
2012	WI	Whitewater Cogeneration Facility	55011	1	RFCW	MISO	316	6.83	1,145	41%